316-2F-AGRF

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
CINCINNATI, OHIO 45268

October 1, 2007

[redacted](Owners)
[redacted] Avenue
Dayton, Ohio 45417

Dear [redacted]:

The purpose of this letter is to inform you of the results of the sub-slab (the space under your basement floor) and indoor air samples collected from your building on April 26, 2007. As you know, these samples were collected to see if soil vapors from the Delphi plant were moving through the soils and entering the air inside your building. They were specifically tested for the presence of chloroform, trichloroethylene (also known as TCE) and tetrachloroethylene (also known as perchloroethylene or PCE), which have been detected under the neighborhood.

These chemicals are volatile organic compounds, which means they easily evaporate (turn from a liquid to a gas) when they are exposed to the soil or air. These chemicals have the potential, as vapors, to move through the soils and work their way into building substructures, such as basements, where they can accumulate in the indoor air.

The results for the samples collected at your building are presented below and are identified as "Detected." Both sub-slab and indoor air samples are measured in units called parts per billion (ppb). Following the result for each sample is the "screening level" for that chemical. The Ohio Department of Health (ODH) has recommended the screening levels for sub-slab and indoor air.

[redacted] **Sub-Slab Sampling Results:**
Detected: Chloroform at 200 ppb, ODH recommended screening level: 22 ppb
Detected: TCE at 110 ppb, ODH recommended screening level: 4 ppb
Detected: PCE at 180 ppb, ODH recommended screening level: 120 ppb

[redacted] **Indoor Air Sampling Results:**
Detected: Chloroform at 0.81 ppb, ODH recommended screening level: 2.2 ppb
Detected: TCE at 0.58 ppb, ODH recommended screening level: 0.4 ppb
Detected: PCE at 0.66 ppb, ODH recommended screening level: 12 ppb

The results from the **sub-slab sample** collected at your building show the chemicals chloroform, TCE, PCE were **found at levels higher** than the screening levels recommended by the ODH. The **indoor air sample** results show the chemical TCE was **found at a level higher** than the screening level recommended by the ODH.

Based on the laboratory results of the sub-slab and indoor air samples collected from your building, the U.S. EPA and ODH recommend that a vapor mitigation system be installed in your building to lower the levels of these chemicals in the indoor air. In

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
CINCINNATI, OHIO 45268

addition to installation of the system, the U.S. EPA and ODH recommend routine sampling at your building to ensure the mitigation system is working properly.

Delphi and the U.S. EPA are working together to address site contamination and to protect the community. We will be contacting you in the near future about installation of the mitigation system at your building.

If you have health-related questions concerning this matter, please contact Bob Frey at the Ohio Department of Health at 614-466-1069. If you have questions related to the sampling or the on-going site investigation, please feel free to contact me at 513-569-7539. You may contact Delphi directly at Delphi's toll-free information number at 1-866-4- DELPHI (1-866-433-5744).

Sincerely,

Steven L. Renninger
On-Scene Coordinator
U.S. EPA Region 5

Attachments: Analytical Results
ODH Fact Sheets (4)

cc: Site File

COLUMBIA ANALYTICAL SERVICES, INC.

RESULTS OF ANALYSIS

Client: Haley & Aldrich, Inc.
Client Sample ID: [redacted]-SS-1
Client Project ID: Home Ave SVI Investigation/26708-089

CAS Project ID: P2701235
CAS Sample ID: P2701235-003

Test Code: EPA TO-15
Instrument ID: Tekmar AUTOCAN/HP5972/HP5890 II+/MS2
Analyst: Chaney Humphrey
Sampling Media: Summa Canister
Test Notes:
Container ID: SC00078

Date Collected: 4/26/07
Date Received: 5/1/07
Date(s) Analyzed: 5/2/07
Volume(s) Analyzed: 0.15 Liter(s)

Pi 1 = -1.9 Pf 1 = 3.5

Can D.F. = 1.42

CAS #	Compound	Result µg/m³	MRL µg/m³	Result ppbV	MRL ppbV	Data Qualifier
74-87-3	Chloromethane	ND	9.5	ND	4.6	
75-01-4	Vinyl Chloride	ND	9.5	ND	3.7	
74-83-9	Bromomethane	ND	9.5	ND	2.4	
75-00-3	Chloroethane	ND	9.5	ND	3.6	
67-64-1	Acetone	560	47	240	20	M
75-69-4	Trichlorofluoromethane	ND	9.5	ND	1.7	
75-35-4	1,1-Dichloroethene	ND	9.5	ND	2.4	
75-09-2	Methylene chloride	ND	9.5	ND	2.7	
76-13-1	Trichlorotrifluoroethane	ND	9.5	ND	1.2	
75-15-0	Carbon Disulfide	ND	9.5	ND	3.0	
156-60-5	trans-1,2-Dichloroethene	ND	9.5	ND	2.4	
75-34-3	1,1-Dichloroethane	ND	9.5	ND	2.3	
1634-04-4	Methyl tert-Butyl Ether	ND	9.5	ND	2.6	
108-05-4	Vinyl Acetate	20	9.5	5.7	2.7	M
78-93-3	2-Butanone (MEK)	320	9.5	110	3.2	
156-59-2	cis-1,2-Dichloroethene	ND	9.5	ND	2.4	
67-66-3	Chloroform	960	9.5	200	1.9	
107-06-2	1,2-Dichloroethane	ND	9.5	ND	2.3	
71-55-6	1,1,1-Trichloroethane	35	9.5	6.4	1.7	
71-43-2	Benzene	25	9.5	7.9	3.0	
56-23-5	Carbon Tetrachloride	ND	9.5	ND	1.5	
78-87-5	1,2-Dichloropropane	ND	9.5	ND	2.0	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.
M = Matrix interference; results may be biased high.

Verified By: RG Date: 5/3/07

COLUMBIA ANALYTICAL SERVICES, INC.

RESULTS OF ANALYSIS

Client: Haley & Aldrich, Inc.
Client Sample ID: [redacted]-SS-1
Client Project ID: Home Ave SVI Investigation/26708-089

CAS Project ID: P2701235
CAS Sample ID: P2701235-003

Test Code: EPA TO-15
Instrument ID: Tekmar AUTOCAN/HP5972/HP5890 II+/MS2
Analyst: Chaney Humphrey
Sampling Media: Summa Canister
Test Notes:
Container ID: SC00078

Date Collected: 4/26/07
Date Received: 5/1/07
Date(s) Analyzed: 5/2/07
Volume(s) Analyzed: 0.15 Liter(s)

Pi 1 = -1.9 Pf 1 = 3.5
Can D.F. = 1.42

CAS #	Compound	Result µg/m³	MRL µg/m³	Result ppbV	MRL ppbV	Data Qualifier
75-27-4	Bromodichloromethane	ND	9.5	ND	1.4	
79-01-6	Trichloroethene	610	9.5	110	1.8	
10061-01-5	cis-1,3-Dichloropropene	ND	9.5	ND	2.1	
108-10-1	4-Methyl-2-pentanone	24	9.5	6.0	2.3	
10061-02-6	trans-1,3-Dichloropropene	ND	9.5	ND	2.1	
79-00-5	1,1,2-Trichloroethane	ND	9.5	ND	1.7	
108-88-3	Toluene	45	9.5	12	2.5	
591-78-6	2-Hexanone	46	9.5	11	2.3	
124-48-1	Dibromochloromethane	ND	9.5	ND	1.1	
106-93-4	1,2-Dibromoethane	ND	9.5	ND	1.2	
127-18-4	Tetrachloroethene	ND	9.5	ND	1.4	
108-90-7	Chlorobenzene	ND	9.5	ND	2.1	
100-41-4	Ethylbenzene	ND	9.5	ND	2.2	
179601-23-1	*m,p*-Xylenes	18	9.5	4.1	2.2	
75-25-2	Bromoform	ND	9.5	ND	0.92	
100-42-5	Styrene	ND	9.5	ND	2.2	
95-47-6	o-Xylene	ND	9.5	ND	2.2	
79-34-5	1,1,2,2-Tetrachloroethane	ND	9.5	ND	1.4	
541-73-1	1,3-Dichlorobenzene	ND	9.5	ND	1.6	
106-46-7	1,4-Dichlorobenzene	ND	9.5	ND	1.6	
95-50-1	1,2-Dichlorobenzene	ND	9.5	ND	1.6	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

Verified By: RG Date: 5/3/07

COLUMBIA ANALYTICAL SERVICES, INC.

RESULTS OF ANALYSIS

Client: Haley & Aldrich, Inc.
Client Sample ID: [redacted]-SS-1
Client Project ID: Home Ave SVI Investigation/26708-089

CAS Project ID: P2701235
CAS Sample ID: P2701235-005

Test Code: EPA TO-15
Instrument ID: Tekmar AUTOCAN/HP5972/HP5890 II+/MS2
Analyst: Chaney Humphrey
Sampling Media: Summa Canister
Test Notes:
Container ID: SC00772

Date Collected: 4/26/07
Date Received: 5/1/07
Date(s) Analyzed: 5/2 - 5/3/07
Volume(s) Analyzed: 1.00 Liter(s)
0.050 Liter(s)

Pi 1 = 0.0 Pf 1 = 3.5

Can D.F. = 1.24

CAS #	Compound	Result µg/m³	MRL µg/m³	Result ppbV	MRL ppbV	Data Qualifier
74-87-3	Chloromethane	ND	1.2	ND	0.60	
75-01-4	Vinyl Chloride	ND	1.2	ND	0.49	
74-83-9	Bromomethane	ND	1.2	ND	0.32	
75-00-3	Chloroethane	ND	1.2	ND	0.47	
67-64-1	Acetone	320	6.2	140	2.6	
75-69-4	Trichlorofluoromethane	1.5	1.2	0.26	0.22	
75-35-4	1,1-Dichloroethene	26	1.2	6.6	0.31	
75-09-2	Methylene chloride	ND	1.2	ND	0.36	
76-13-1	Trichlorotrifluoroethane	ND	1.2	ND	0.16	
75-15-0	Carbon Disulfide	ND	1.2	ND	0.40	
156-60-5	trans-1,2-Dichloroethene	ND	1.2	ND	0.31	
75-34-3	1,1-Dichloroethane	16	1.2	4.0	0.31	
1634-04-4	Methyl tert-Butyl Ether	3.8	1.2	1.1	0.34	
108-05-4	Vinyl Acetate	5.3	1.2	1.5	0.35	M
78-93-3	2-Butanone (MEK)	130	1.2	45	0.42	
156-59-2	cis-1,2-Dichloroethene	4.9	1.2	1.2	0.31	
67-66-3	Chloroform	270	1.2	56	0.25	
107-06-2	1,2-Dichloroethane	ND	1.2	ND	0.31	
71-55-6	1,1,1-Trichloroethane	350	1.2	64	0.23	
71-43-2	Benzene	2.6	1.2	0.82	0.39	
56-23-5	Carbon Tetrachloride	ND	1.2	ND	0.20	
78-87-5	1,2-Dichloropropane	ND	1.2	ND	0.27	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.
M = Matrix interference; results may be biased high.

Verified By: RLS Date: 5/3/07

COLUMBIA ANALYTICAL SERVICES, INC.

RESULTS OF ANALYSIS

Client: Haley & Aldrich, Inc.
Client Sample ID: Ex. 6 P... Names...-SS-1
Client Project ID: Home Ave SVI Investigation/26708-089

CAS Project ID: P2701235
CAS Sample ID: P2701235-005

Test Code: EPA TO-15
Instrument ID: Tekmar AUTOCAN/HP5972/HP5890 II+/MS2
Analyst: Chaney Humphrey
Sampling Media: Summa Canister
Test Notes:
Container ID: SC00772

Date Collected: 4/26/07
Date Received: 5/1/07
Date(s) Analyzed: 5/2 - 5/3/07
Volume(s) Analyzed: 1.00 Liter(s)
0.050 Liter(s)

Pi 1 = 0.0 Pf 1 = 3.5

Can D.F. = 1.24

CAS #	Compound	Result µg/m³	MRL µg/m³	Result ppbV	MRL ppbV	Data Qualifier
75-27-4	Bromodichloromethane	**3.2**	1.2	**0.47**	0.19	
79-01-6	Trichloroethene	**280**	1.2	**52**	0.23	
10061-01-5	cis-1,3-Dichloropropene	ND	1.2	ND	0.27	
108-10-1	4-Methyl-2-pentanone	**11**	1.2	**2.7**	0.30	
10061-02-6	trans-1,3-Dichloropropene	ND	1.2	ND	0.27	
79-00-5	1,1,2-Trichloroethane	ND	1.2	ND	0.23	
108-88-3	Toluene	**8.7**	1.2	**2.3**	0.33	
591-78-6	2-Hexanone	**3.6**	1.2	**0.87**	0.30	
124-48-1	Dibromochloromethane	ND	1.2	ND	0.15	
106-93-4	1,2-Dibromoethane	ND	1.2	ND	0.16	
127-18-4	Tetrachloroethene	**1,200**	1.2	**180**	0.18	
108-90-7	Chlorobenzene	ND	1.2	ND	0.27	
100-41-4	Ethylbenzene	**1.6**	1.2	**0.38**	0.29	
179601-23-1	*m,p*-Xylenes	**6.1**	1.2	**1.4**	0.29	
75-25-2	Bromoform	ND	1.2	ND	0.12	
100-42-5	Styrene	ND	1.2	ND	0.29	
95-47-6	o-Xylene	**2.0**	1.2	**0.45**	0.29	
79-34-5	1,1,2,2-Tetrachloroethane	ND	1.2	ND	0.18	
541-73-1	1,3-Dichlorobenzene	ND	1.2	ND	0.21	
106-46-7	1,4-Dichlorobenzene	ND	1.2	ND	0.21	
95-50-1	1,2-Dichlorobenzene	ND	1.2	ND	0.21	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

Verified By: RC Date: 5/3/07

COLUMBIA ANALYTICAL SERVICES, INC.

RESULTS OF ANALYSIS

Client: Haley & Aldrich, Inc.
Client Sample ID: Ex. 6 P... Names...-InA-1
Client Project ID: Home Ave SVI Investigation/26708-089

CAS Project ID: P2701235
CAS Sample ID: P2701235-004

Test Code: EPA TO-15
Instrument ID: Tekmar AUTOCAN/HP5972/HP5890 II+/MS2
Analyst: Chaney Humphrey
Sampling Media: Summa Canister
Test Notes:
Container ID: AC00635

Date Collected: 4/26/07
Date Received: 5/1/07
Date(s) Analyzed: 5/2/07
Volume(s) Analyzed: 1.00 Liter(s)

Pi 1 = -2.5 Pf 1 = 3.5

Can D.F. = 1.49

CAS #	Compound	Result µg/m³	MRL µg/m³	Result ppbV	MRL ppbV	Data Qualifier
74-87-3	Chloromethane	ND	1.5	ND	0.72	
75-01-4	Vinyl Chloride	ND	1.5	ND	0.58	
74-83-9	Bromomethane	ND	1.5	ND	0.38	
75-00-3	Chloroethane	ND	1.5	ND	0.56	
67-64-1	Acetone	**22**	7.5	**9.1**	3.1	**M**
75-69-4	Trichlorofluoromethane	ND	1.5	ND	0.27	
75-35-4	1,1-Dichloroethene	ND	1.5	ND	0.38	
75-09-2	Methylene chloride	ND	1.5	ND	0.43	
76-13-1	Trichlorotrifluoroethane	ND	1.5	ND	0.19	
75-15-0	Carbon Disulfide	ND	1.5	ND	0.48	
156-60-5	trans-1,2-Dichloroethene	ND	1.5	ND	0.38	
75-34-3	1,1-Dichloroethane	ND	1.5	ND	0.37	
1634-04-4	Methyl tert-Butyl Ether	ND	1.5	ND	0.41	
108-05-4	Vinyl Acetate	**2.7**	1.5	**0.77**	0.42	
78-93-3	2-Butanone (MEK)	**2.0**	1.5	**0.68**	0.51	
156-59-2	cis-1,2-Dichloroethene	ND	1.5	ND	0.38	
67-66-3	Chloroform	**3.9**	1.5	**0.81**	0.31	
107-06-2	1,2-Dichloroethane	ND	1.5	ND	0.37	
71-55-6	1,1,1-Trichloroethane	ND	1.5	ND	0.27	
71-43-2	Benzene	ND	1.5	ND	0.47	
56-23-5	Carbon Tetrachloride	ND	1.5	ND	0.24	
78-87-5	1,2-Dichloropropane	ND	1.5	ND	0.32	

ND = Compound was analyzed for, but not detected above the **laboratory reporting limit.**
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.
M = Matrix interference; results may be biased high.

Verified By: RL Date: 5/3/07

COLUMBIA ANALYTICAL SERVICES, INC.

RESULTS OF ANALYSIS

Client: Haley & Aldrich, Inc.
Client Sample ID: [redacted] InA-1
Client Project ID: Home Ave SVI Investigation/26708-089

CAS Project ID: P2701235
CAS Sample ID: P2701235-004

Test Code: EPA TO-15
Instrument ID: Tekmar AUTOCAN/HP5972/HP5890 II+/MS2
Analyst: Chaney Humphrey
Sampling Media: Summa Canister
Test Notes:
Container ID: AC00635

Date Collected: 4/26/07
Date Received: 5/1/07
Date(s) Analyzed: 5/2/07
Volume(s) Analyzed: 1.00 Liter(s)

Pi l = -2.5 Pf l = 3.5
Can D.F. = 1.49

CAS #	Compound	Result µg/m³	MRL µg/m³	Result ppbV	MRL ppbV	Data Qualifier
75-27-4	Bromodichloromethane	ND	1.5	ND	0.22	
79-01-6	Trichloroethene	**3.1**	1.5	**0.58**	0.28	
10061-01-5	cis-1,3-Dichloropropene	ND	1.5	ND	0.33	
108-10-1	4-Methyl-2-pentanone	ND	1.5	ND	0.36	
10061-02-6	trans-1,3-Dichloropropene	ND	1.5	ND	0.33	
79-00-5	1,1,2-Trichloroethane	ND	1.5	ND	0.27	
108-88-3	Toluene	**3.2**	1.5	**0.85**	0.40	
591-78-6	2-Hexanone	ND	1.5	ND	0.36	
124-48-1	Dibromochloromethane	ND	1.5	ND	0.17	
106-93-4	1,2-Dibromoethane	ND	1.5	ND	0.19	
127-18-4	Tetrachloroethene	**1.6**	1.5	**0.23**	0.22	
108-90-7	Chlorobenzene	ND	1.5	ND	0.32	
100-41-4	Ethylbenzene	ND	1.5	ND	0.34	
179601-23-1	*m,p* -Xylenes	ND	1.5	ND	0.34	
75-25-2	Bromoform	ND	1.5	ND	0.14	
100-42-5	Styrene	ND	1.5	ND	0.35	
95-47-6	o-Xylene	ND	1.5	ND	0.34	
79-34-5	1,1,2,2-Tetrachloroethane	ND	1.5	ND	0.22	
541-73-1	1,3-Dichlorobenzene	ND	1.5	ND	0.25	
106-46-7	1,4-Dichlorobenzene	ND	1.5	ND	0.25	
95-50-1	1,2-Dichlorobenzene	ND	1.5	ND	0.25	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

Verified By: RL Date: 5/3/07

COLUMBIA ANALYTICAL SERVICES, INC.

RESULTS OF ANALYSIS

Client: Haley & Aldrich, Inc.
Client Sample ID: [redacted]-InA-1
Client Project ID: Home Ave SVI Investigation/26708-089

CAS Project ID: P2701235
CAS Sample ID: P2701235-006

Test Code: EPA TO-15
Instrument ID: Tekmar AUTOCAN/HP5972/HP5890 II+/MS2
Analyst: Chaney Humphrey
Sampling Media: Summa Canister
Test Notes:
Container ID: AC00740

Date Collected: 4/26/07
Date Received: 5/1/07
Date(s) Analyzed: 5/2/07
Volume(s) Analyzed: 1.00 Liter(s)

Pi 1 = -5.0 Pf 1 = 3.5
Can D.F. = 1.88

CAS #	Compound	Result µg/m³	MRL µg/m³	Result ppbV	MRL ppbV	Data Qualifier
74-87-3	Chloromethane	ND	1.9	ND	0.91	
75-01-4	Vinyl Chloride	ND	1.9	ND	0.74	
74-83-9	Bromomethane	ND	1.9	ND	0.48	
75-00-3	Chloroethane	ND	1.9	ND	0.71	
67-64-1	Acetone	15	9.4	6.4	4.0	M
75-69-4	Trichlorofluoromethane	ND	1.9	ND	0.33	
75-35-4	1,1-Dichloroethene	ND	1.9	ND	0.47	
75-09-2	Methylene chloride	ND	1.9	ND	0.54	
76-13-1	Trichlorotrifluoroethane	ND	1.9	ND	0.25	
75-15-0	Carbon Disulfide	ND	1.9	ND	0.60	
156-60-5	trans-1,2-Dichloroethene	ND	1.9	ND	0.47	
75-34-3	1,1-Dichloroethane	ND	1.9	ND	0.46	
1634-04-4	Methyl tert-Butyl Ether	ND	1.9	ND	0.52	
108-05-4	Vinyl Acetate	ND	1.9	ND	0.53	
78-93-3	2-Butanone (MEK)	2.3	1.9	0.77	0.64	
156-59-2	cis-1,2-Dichloroethene	ND	1.9	ND	0.47	
67-66-3	Chloroform	ND	1.9	ND	0.39	
107-06-2	1,2-Dichloroethane	ND	1.9	ND	0.46	
71-55-6	1,1,1-Trichloroethane	ND	1.9	ND	0.34	
71-43-2	Benzene	ND	1.9	ND	0.59	
56-23-5	Carbon Tetrachloride	ND	1.9	ND	0.30	
78-87-5	1,2-Dichloropropane	ND	1.9	ND	0.41	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.
M = Matrix interference; results may be biased high.

Verified By: RG Date: 5/8/07

COLUMBIA ANALYTICAL SERVICES, INC.

RESULTS OF ANALYSIS

Client: Haley & Aldrich, Inc.
Client Sample ID: [redacted]-InA-1
Client Project ID: Home Ave SVI Investigation/26708-089

CAS Project ID: P2701235
CAS Sample ID: P2701235-006

Test Code: EPA TO-15
Instrument ID: Tekmar AUTOCAN/HP5972/HP5890 II+/MS2
Analyst: Chaney Humphrey
Sampling Media: Summa Canister
Test Notes:
Container ID: AC00740

Date Collected: 4/26/07
Date Received: 5/1/07
Date(s) Analyzed: 5/2/07
Volume(s) Analyzed: 1.00 Liter(s)

Pi l = -5.0 Pf l = 3.5
Can D.F. = 1.88

CAS #	Compound	Result µg/m³	MRL µg/m³	Result ppbV	MRL ppbV	Data Qualifier
75-27-4	Bromodichloromethane	ND	1.9	ND	0.28	
79-01-6	Trichloroethene	ND	1.9	ND	0.35	
10061-01-5	cis-1,3-Dichloropropene	ND	1.9	ND	0.41	
108-10-1	4-Methyl-2-pentanone	ND	1.9	ND	0.46	
10061-02-6	trans-1,3-Dichloropropene	ND	1.9	ND	0.41	
79-00-5	1,1,2-Trichloroethane	ND	1.9	ND	0.34	
108-88-3	Toluene	ND	1.9	ND	0.50	
591-78-6	2-Hexanone	ND	1.9	ND	0.46	
124-48-1	Dibromochloromethane	ND	1.9	ND	0.22	
106-93-4	1,2-Dibromoethane	ND	1.9	ND	0.24	
127-18-4	Tetrachloroethene	**4.5**	1.9	**0.66**	0.28	
108-90-7	Chlorobenzene	ND	1.9	ND	0.41	
100-41-4	Ethylbenzene	ND	1.9	ND	0.43	
179601-23-1	*m,p* -Xylenes	ND	1.9	ND	0.43	
75-25-2	Bromoform	ND	1.9	ND	0.18	
100-42-5	Styrene	ND	1.9	ND	0.44	
95-47-6	o-Xylene	ND	1.9	ND	0.43	
79-34-5	1,1,2,2-Tetrachloroethane	ND	1.9	ND	0.27	
541-73-1	1,3-Dichlorobenzene	ND	1.9	ND	0.31	
106-46-7	1,4-Dichlorobenzene	ND	1.9	ND	0.31	
95-50-1	1,2-Dichlorobenzene	ND	1.9	ND	0.31	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

Verified By: RC Date: 5/3/07

Bureau of
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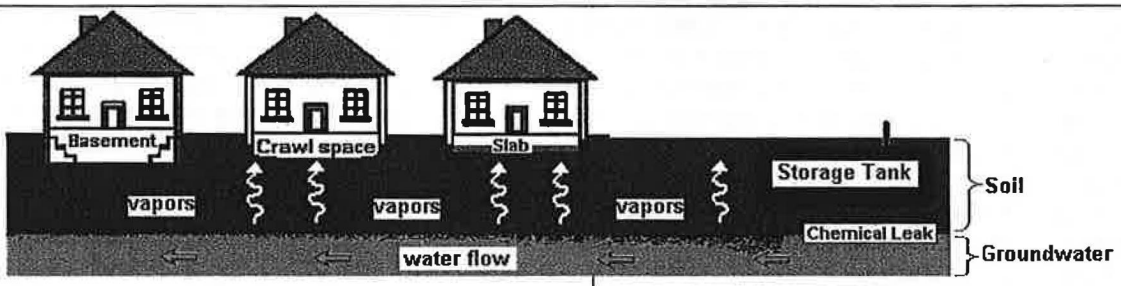
Vapor Intrusion

Answers to Frequently Asked Health Questions



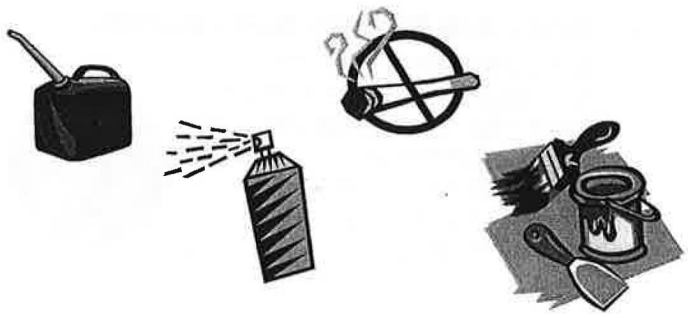
What is vapor intrusion?

Vapor intrusion refers to the vapors produced by a chemical spill/leak that make their way into indoor air. When chemicals are spilled on the ground or leak from an underground storage tank, they will seep into the soils and will sometimes make their way into the groundwater (underground drinking water). There are a group of chemicals called volatile organic compounds (VOCs) that easily produce vapors. These vapors can travel through soils, especially if the soils are sandy and loose or have a lot of cracks (fissures). These vapors can then enter a home through cracks in the foundation or into a basement with a dirt floor or concrete slab.

VOCs and vapors:

VOCs can be found in petroleum products such as gasoline or diesel fuels, in solvents used for industrial cleaning and are also used in dry cleaning. If there is a large spill or leak resulting in soil or groundwater contamination, vapor intrusion may be possible and should be considered a potential public health concern that may require further investigation.

Although large spills or leaks are a public health concern, other sources of VOCs are found in everyday household products and are a more common source of poor indoor air quality. Common products such as paint, paint strippers and thinners, hobby supplies (glues), solvents, stored fuels (gasoline or home heating fuel), aerosol sprays, new carpeting or furniture, cigarette smoke, moth balls, air fresheners and dry-cleaned clothing all contain VOCs.



Can you get sick from vapor intrusion?

You can get sick from breathing harmful chemical vapors. But getting sick will depend on:
How much you were exposed to (dose).
How long you were exposed (duration).
How often you were exposed (frequency).
How toxic the spill/leak chemicals are.
General Health, age, lifestyle: Young children, the elderly and people with chronic (on-going) health problems are more at risk to chemical exposures.

VOC vapors at high levels can cause a strong petroleum or solvent odor and some persons may experience eye and respiratory irritation, headache and/or nausea (upset stomach). These symptoms are usually temporary and go away when the person is moved to fresh air.

Lower levels of vapors may go unnoticed and a person may feel no health effects. A few individual VOCs are known carcinogens (cause cancer). Health officials are concerned with low-level chemical exposures that happen over many years and may raise a person's lifetime risk for developing cancer.

How is vapor intrusion investigated?

In most cases, collecting soil gas or groundwater samples near the spill site is done first to see if there is on-site contamination. If soil vapors or groundwater contamination are detected at a spill site, environmental protection and public health officials may then ask that soil vapor samples be taken from areas outside the immediate spill site and near any potential affected business or home. The Ohio Department of Health (ODH) does not usually recommend indoor air sampling for vapor intrusion before the on-site contamination is determined.

(continued on next page)

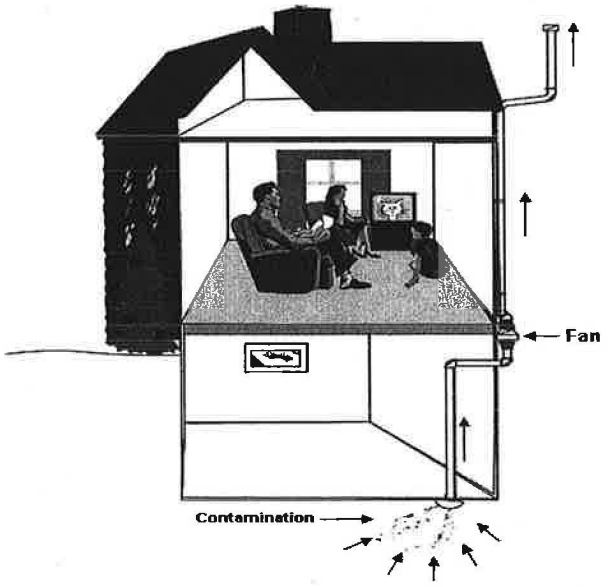
How is vapor intrusion investigated? (continued)

Because a variety of VOC sources are present in most homes, testing will not necessarily confirm VOCs in the indoor air are from VOC contamination in soils at nearby spill site. But if additional sampling is recommended, samples may be taken from beneath the home's foundation (called sub-slab samples), to see if vapors have reached the home. Sub-slab samples are more reliable than indoor air samples and are not as affected by other indoor chemical sources. If there was a need for additional sampling on a private property, homeowners would be contacted by the cleanup contractor or others working on the cleanup site and their cooperation and consent would be requested before any testing/sampling would be done.

What happens if a vapor intrusion problem is found?

If vapor intrusion is having an effect on the air in your home, the most common solution is to install a *radon mitigation system*. A radon mitigation system will prevent gases in the soil from entering the home. A low amount of suction is applied below the foundation and the vapors are vented to the outside. The system uses minimal electricity and should not noticeably affect heating and cooling efficiency. This mitigation system also prevents radon from entering the home, an added health benefit. Usually, the party responsible for cleaning up the contamination is also responsible for paying for the installation of this system. Once the contamination is cleaned up, the system should no longer be needed. In homes with on going radon problems, ODH suggests these systems remain in place permanently.

Radon Mitigation System



What can you do to improve your indoor air quality?

As stated before, the most likely source of VOCs in indoor air comes from the common items that are found in most homes. The following helpful hints will help improve air quality inside your home:

- Do not buy more chemicals than you need and know what products contain VOCs.
- If you have a garage or an out building such as a shed, place the properly stored VOC-containing chemicals outside and away from your family living areas.
- Immediately clean and ventilate any VOC spill area.
- If you smoke, go outside and/or open the windows to ventilate the second-hand, VOC-containing smoke outdoors.
- Make sure all your major appliances and fireplace(s) are in good condition and not leaking harmful VOC vapors. Fix all appliance and fireplace leaks promptly, as well as other leaks that cause moisture problems that encourage mold growth.
- Most VOCs are a fire hazard. Make sure these chemicals are stored in appropriate containers and in a well-ventilated location and away from an open pilot light (flame) of a gas water heater or furnace.
- Fresh air will help prevent both build up of chemical vapors in the air and mold growth. Occasionally open the windows and doors and ventilate.
- Test your home for radon and install a radon detector.

References:

Wisconsin Department of Health and Family Services, Environmental Health Resources, Vapor Intrusion, electronic, 2004.

New York State Department of Health, Center for Environmental Health, April 2003.

Ohio Department of Health, Bureau of Environmental Health, Indoor Environment Program, 2004.

For more information contact:

Ohio Department of Health
Bureau of Environmental Health
Health Assessment Section
246 N. High Street
Columbus, Ohio 43215
Phone: (614) 466-1390
Fax: (614) 466-4556

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Bureau of
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Health Assessment Section
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Chloroform

Answers to Frequently Asked Health Questions

What is chloroform?

Chloroform, also called trichloromethane or methyltrichloride, is a colorless liquid with a pleasant, non-irritating odor and a slightly sweet taste. As a volatile organic compound (VOC), chloroform easily vaporizes (turns into a gas) in the air. Chloroform does not easily burn, but it will burn when it reaches very high temperatures. Chloroform was one of the first inhaled anesthetics to be used during surgery, but it is not used as an anesthesia today.

Where do you find chloroform?

In order to destroy the harmful bacteria found in our drinking water and waste waters, the chemical chlorine is added to these water sources. As a by-product of adding chlorine to our drinking and waste waters, small amounts of chloroform are formed. So small amounts of chloroform are likely to be found almost everywhere.

In industry, nearly all the chloroform made in the U.S. is used to make other chemicals. From the factories that make or use this chemical, chloroform can enter the air directly or it can enter the air from the evaporation (changing from liquid to a gas) of chloroform-contaminated waters and soils. Chloroform can also enter the water and soils from industry storage and waste sites spills and leaks.

Not only does chloroform evaporate very quickly when exposed to air, it also dissolves easily in water and does not stick to the soils very well. This means chloroform can easily travel through the soils to groundwater, where it can enter a water supply. Chloroform lasts a long time in both the air and in groundwater. Most of the chloroform in the air eventually breaks down, but it is a slow process. Chloroform does not appear to build up in great amounts in plants and animals, but we may find some small amounts of chloroform in foods.

How do you come in contact with chloroform? Who is more at risk?

You are most likely to be exposed to chloroform by drinking contaminated water and/or by breathing contaminated indoor or outdoor air. Chloroform is found in nearly all public drinking water supplies. Chloroform is also found in the air from all areas of the United States. You are probably exposed to small amounts of chloroform in your drinking water and/or in beverages that are made using water that contains chloroform.

People who are at greater risk to be exposed to chloroform at higher-than-normal levels are people who work at or near chemical plants and factories that make or use chloroform. Higher exposures might occur in workers at drinking water treatment plants, waste water treatment plants, and paper and pulp mills. People who operate waste-burning equipment may also be exposed to higher than normal levels. People who swim a lot in swimming pools may also be exposed to higher levels.

How does chloroform enter and leave your body?

- Chloroform can enter your body if you breathe contaminated air (inhalation)
- Chloroform can enter your body if you eat/drink contaminated food or water (ingestion)
- Chloroform can also enter your body through the skin (dermal).

If you take a bath, shower or swim in a pool with chloroform-contaminated water, it can enter your body through inhalation and dermal contact.

Studies in humans and animals show that after you breathe contaminated air or eat contaminated food, the chloroform can quickly enter your bloodstream from your lungs and intestines. Inside your body, chloroform is carried by the blood to all parts of your body, such as the liver, kidneys and fat cells.

Some of the chloroform that enters your body leaves unchanged in the air you breathe out and some of it is broken down into other chemicals. These chemicals are known as breakdown products or metabolites, and some of them can attach to other chemicals inside the cells of your body and may cause harmful effects if they collect in high enough amounts in your body. Some of the metabolites will leave the body in the air you breathe out and small amounts of the breakdown products leave the body in the urine and stool.

How does chloroform affect health?

In humans, large amounts of chloroform can affect the central nervous system (brain), liver and kidneys. Breathing high levels for a short time can cause fatigue, dizziness, and headache. If you breathe air, eat food, or drink water containing elevated levels of chloroform, over a long period, the chloroform may damage your liver and kidneys. Large amounts of chloroform can cause sores (lesions) when the chloroform touches your skin.

Lab studies have shown chloroform caused reproductive problems in animals (mice and rats). However, there is no evidence that show whether chloroform causes harmful reproductive effects or birth defects in humans.

Does chloroform cause cancer?

Based on animal studies, the Department of Health and Human Services (DHHS) has determined that chloroform may reasonably be anticipated to be a carcinogen (a substance that causes cancer). The International Agency for Research on Cancer (IARC) has determined that chloroform is possibly carcinogenic to humans (2B). The EPA has also determined that chloroform is a "probable" human carcinogen.

Results of studies of people who drank chlorinated water showed a possible link between the chloroform in the chlorinated water and the occurrence of cancer of the colon and urinary bladder. Rats and mice that ate food or drank water that had large amounts of chloroform in it for a long period of time developed cancer of the liver and kidneys. However, there is no evidence that shows whether chloroform causes liver and kidney cancer in humans.

Is there a medical test to show whether you have been exposed to chloroform?

Although we can measure the amount of chloroform in the air you breathe out and in blood, urine, and body tissues, we have no reliable test to determine how much chloroform you have been exposed to or whether you will experience any harmful health effects.

The measurement of chloroform in body fluids and tissues may help to determine if you have come into contact with large amounts of chloroform. However, these tests are useful only a short time after you are exposed to chloroform because it leaves the body quickly.

What has been done to protect human health?

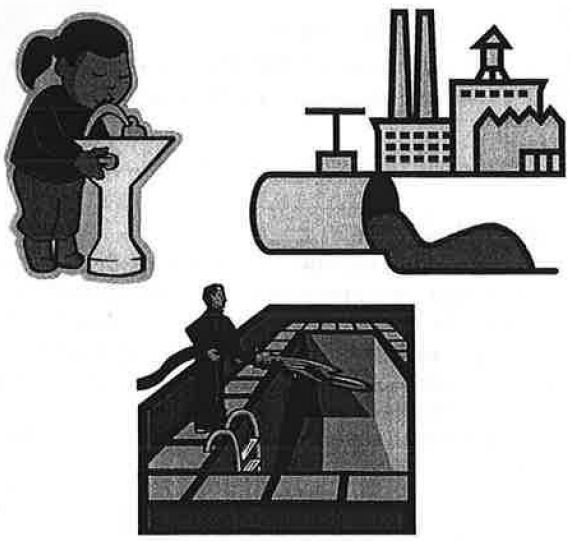
The amount of chloroform normally expected to be in the air ranges from 0.02 to 0.05 parts of chloroform per billion parts (ppb) of air and from 2 to 44 ppb in treated drinking water.

Notes: The below unit of measurement will be found in the ppb (parts per billion) range. Examples: One part per billion (1 ppb) would be equal to having one bean in a pile of one billion beans, or one ppb would be equal to one second of time in 32 years.

The Environmental Protection Agency (EPA) has set the level of chloroform in drinking water at 80 ppb.

The Occupational Safety and Health Administration (OSHA) has set a permissible 50,000 ppb exposure limit of air in the workplace during an 8-hour workday, 40-hour week.

The EPA requires chloroform spills or accidental releases into the environment of 10 pounds or more of be reported to the EPA.



For more information contact:

Ohio Department of Health
Bureau of Environmental Health
Health Assessment Section
246 N. High Street
Columbus, Ohio 43215
Phone: (614) 466-1390
Fax: (614) 466-4556

Reference:

Agency for Toxic Substances and Disease Registry (ATSDR). 1997. Toxicological profile for chloroform. Atlanta, GA: U.S. Department of Health and Human Services, Public Health Service.

The Ohio Department of Health is in cooperative agreement with the Agency for Toxic Substances and Disease Registry (ATSDR), Public Health Service, U.S. Department of Health and Human Services.

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ATSDR
AGENCY FOR TOXIC SUBSTANCES AND DISEASE REGISTRY

Created 04/10/07

Bureau of Environmental Health
Health Assessment Section

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Trichloroethylene (TCE)

(try- klor'oh eth'uh- leen)

Answers to Frequently Asked Health Questions

What is TCE?

TCE is man-made chemical that is not found naturally in the environment. TCE is a non-flammable (does not burn), colorless liquid with a somewhat sweet odor and has a sweet, "burning" taste. It is mainly used as a cleaner to remove grease from metal parts. TCE can also be found in glues, paint removers, typewriter correction fluids and spot removers.

The biggest source of TCE in the environment comes from evaporation (changing from a liquid into a vapor/gas) when industries use TCE to remove grease from metals. But TCE also enters the air when we use common household products that contain TCE. It can also enter the soil and water as the result of spills or improper disposal.

What happens to TCE in the environment?

- TCE will quickly evaporate from the surface waters of rivers, lakes, streams, creeks and puddles.
- If TCE is spilled on the ground, some of it will evaporate and some of it may leak down into the ground. When it rains, TCE can sink through the soils and into the ground (underground drinking) water.
- When TCE is in an oxygen-poor environment and with time, it will break down into different chemicals such as 1,2 Dichloroethene and Vinyl Chloride.
- TCE does not build up in plants and animals.
- The TCE found in foods is believed to come from TCE contaminated water used in food processing or from food processing equipment cleaned with TCE.

How does TCE get into your body?

- TCE can get into your body by breathing (inhalation) air that is polluted with TCE vapors. The vapors can be produced from the manufacturing of TCE, from TCE polluted water evaporating in the shower or by using household products such as spot removers and typewriter correction fluid.
- TCE can get into your body by drinking (ingestion) TCE polluted water.
- Small amounts of TCE can get into your body through skin (dermal) contact. This can take place when using TCE as a cleaner to remove grease from metal parts or by contact with TCE polluted soils.

Can TCE make you sick?

Yes, you can get sick from TCE. But getting sick will depend on the following:

- How much you were exposed to (dose).
- How long you were exposed (duration).
- How often you were exposed (frequency).
- General Health, Age, Lifestyle Young children, the elderly and people with chronic (on-going) health problems are more at risk to chemical exposures.

How does TCE affect your health?

Breathing (Inhalation):

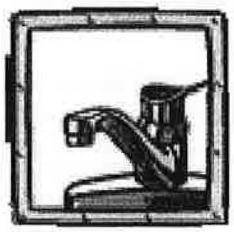
- Breathing high levels of TCE may cause headaches, lung irritation, dizziness, poor coordination (clumsy) and difficulty concentrating.
- Breathing very high levels of TCE for long periods may cause nerve, kidney and liver damage.

Drinking (Ingestion):

- Drinking high concentrations of TCE in the water for long periods may cause liver and kidney damage, harm immune system functions and damage fetal development in pregnant women (although the extent of some of these effects is not yet clear).
- It is uncertain whether drinking low levels of TCE will lead to adverse health effects.

Skin (Dermal) Contact:

- Short periods of skin contact with high levels of TCE may cause skin rashes.



Does TCE cause cancer?

The National Toxicology Program's 11th Report on Carcinogens places chemicals into one of two cancer-causing categories: *Known to be Human Carcinogens* and *Reasonably Anticipated to be Human Carcinogens.*

The11th Report on Carcinogens states TCE is *"Reasonably Anticipated to be Human Carcinogen."*

The category *"Reasonably Anticipated to be Human Carcinogen"* gathers evidence mainly from animal studies. There may be limited human studies or there may be no human or animal study evidence to support carcinogenicity; but the agent, substance or mixture belongs to a well-defined class of substances that are known to be carcinogenic.

There are human studies of communities that were exposed to high levels of TCE in drinking water and they have found evidence of increased leukemia's. But the residents of these communities were also exposed to other solvents and may have had other risk factors associated with this type of cancer.

Animal lab studies in mice and rats have suggested that high levels of TCE may cause liver, lung, kidney and blood (lymphoma) cancers.

As part of the National Exposure Subregistry, the Agency for Toxic Substances and Disease Registry (ATSDR) compiled data on 4,280 residents of three states (Michigan, Illinois, and Indiana) who had environmental exposure to TCE. ATSDR found no definitive evidence for an excess of cancers from these TCE exposures.

The U.S. EPA is currently reviewing the carcinogenicity of TCE.

Is there a medical test to show whether you have been exposed to TCE?

If you have recently been exposed to TCE, it can be detected in your breath, blood, or urine. The breath test, if done soon after exposure, can tell if you have been exposed to even a small amount of TCE.

Exposure to larger amounts is measured in blood and urine tests. These tests detect TCE and many of its breakdown products for up to a week after exposure. However, exposure to other similar chemicals can produce the same breakdown products in the blood and urine so the detection of the breakdown products is not absolute proof of exposure to TCE.

These tests aren't available at most doctors' offices, but can be done at special laboratories that have the right equipment. **Note:** Tests can determine if you have been exposed to TCE but cannot predict if you will experience adverse health effects from the exposure.

Has the federal government made recommendations to protect human health?

The federal government develops regulations and recommendations to protect public health and these regulations can be enforced by law.

Recommendations and regulations are periodically updated as more information becomes available. Some regulations and recommendations for TCE follow:

- The Environmental Protection Agency (EPA) has set a maximum contaminant level for TCE in drinking water at 0.005 milligrams per liter (0.005 mg/L) or 5 parts of TCE per billion parts water (5 ppb).
- The Occupational Safety and Health Administration (OSHA) have set an exposure limit of 100 ppm (or 100 parts of TCE per million parts of air) for an 8-hour workday, 40-hour workweek.
- The EPA has developed regulations for the handling and disposal of TCE.

References

Agency for Toxic Substances and Disease Registry (ATSDR). 1997. Toxicological profile for TCE (electronic at **http://www.atsdr.cdc.gov/tfacts19.html**)

Report on Carcinogens, Eleventh Edition; U.S. Department of Health and Human Services, Public Health Service, National Toxicology Program, 2005 (2005 electronic at **http://ntp.niehs.nih.gov/ntp/roc/toc11.html**)

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ATSDR
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Bureau of Environmental Health
Health Assessment Section

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Tetrachloroethylene (PCE)

Other names for tetrachloroethylene include PCE, perchloroethylene, PERC or tetrachloroethene.

What is PCE?

Tetrachloroethylene (also known as PCE, PERC or perchloroethylene) is a man-made chemical that is widely used for dry cleaning clothes and degreasing metal. It is also used to make other chemicals and can be found in some household products such as water repellents, silicone lubricants, spot removers, adhesives and wood cleaners. It easily evaporates (turn from a liquid to a gas) into the air and has a sharp, sweet odor. PCE is a nonflammable (does not burn) liquid at room temperature.

How does PCE get into the environment?

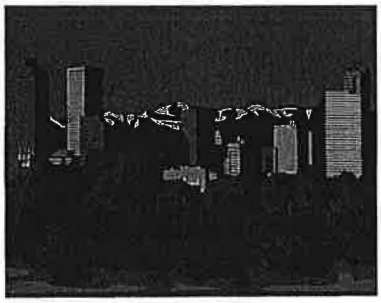
PCE can evaporate into the air during dry cleaning operations and during industrial use. It can also evaporate into the air if it is not properly stored or was spilled. If it was spilled or leaked on the ground, it may find its way into groundwater (underground drinking water).

People can be exposed to PCE from the environment from household products, from dry cleaning products and from their occupation (work). Common environmental levels of PCE (called background levels) can be found in the air we breathe, in the water we drink and in the food we eat. In general, levels in the air are higher in the cities or around industrial areas where it is used more than rural or remote areas.

The people with the greatest chance of exposure to PCE are those who work with it. According to estimates from a survey conducted by the National Institute for Occupational Safety and Health (NIOSH), more than 650,000 U.S. workers may be exposed. However, the air close to dry cleaning business and industrial sites may have levels of PCE higher than background levels. If the dry cleaning business or industry has spilled or leaked PCE on the ground, there may also be contaminated groundwater as well.

What happens to PCE in the environment?

Much of the PCE that gets into surface waters or soil evaporates into the air. However, some of the PCE may make its way to the groundwater. Microorganisms can break down some of the PCE in soil or underground water. In the air, it is broken down by sunlight into other chemicals or brought back to the soil and water by rain. PCE does not appear to collect in fish or other animals that live in water.



How can PCE enter and leave my body?

PCE can enter your body when you breathe contaminated air or when you drink water or eat food contaminated with the chemical. If PCE is trapped against your skin, a small amount of it can pass through into your body. Very little PCE in the air can pass through your skin into your body. Breathing contaminated air and drinking water are the two most likely ways people will be exposed to PCE. How much enters your body depends on how much of the chemical is in the air, how fast and deeply you are breathing, how long you are exposed to it or how much of the chemical you eat or drink.

Most PCE leaves your body from your lungs when you breathe out. This is true whether you take in the chemical by breathing, drinking, eating, or touching it. A small amount is changed by your body (in your liver) into other chemicals that are removed from your body in urine. Most of the changed PCE leaves your body in a few days. Some of it that you take in is found in your blood and other tissues, especially body fat. Part of the PCE that is stored in fat may stay in your body for several days or weeks before it is eliminated.

Can PCE make you sick?

Yes, you can get sick from contact with PCE. But getting sick will depend upon:

- How much you were exposed to (dose).
- How long you were exposed (duration).
- How often you were exposed (frequency).
- General Health, Age, Lifestyle Young children, the elderly and people with chronic (on-going) health problems are more at risk to chemical exposures.

How can PCE affect my health?

Exposure to very high concentrations of PCE (particularly in closed, poorly ventilated areas) can cause dizziness, headache, sleepiness, confusion, nausea, difficulty in speaking and walking, unconsciousness and even death. Skin irritation may result from repeated or extended contact with it as well. These symptoms occur almost entirely in work (or hobby) environments when people have been accidentally exposed to high concentrations or have intentionally used PCE to get a "high." Normal background levels (or common environmental levels) will not cause these health affects.

Does PCE cause cancer (carcinogen)?

In the United States, the National Toxicology Program (NTP) releases the *Report on Carcinogens* (RoC) every two years. The *Report on Carcinogens* (RoC) identifies two groups of agents: "Known to be human carcinogens" & "Reasonably anticipated to be human carcinogens."

PCE has been shown to cause liver tumors in mice and kidney tumors in male rats. There is limited evidence for the carcinogenicity of PCE in humans. PCE has been studied by observing laundry and dry-cleaning workers, who may also have been exposed to other solvents, especially trichloroethylene (TCE), but also petroleum solvents.

The *Eleventh Report on Carcinogens* (RoC) has determined that PCE may reasonably be anticipated to be a carcinogen.

Reference:

Agency for Toxic Substances and Disease Registry (ATSDR). 1997. Toxicological Profile for tetrachloroethylene. Atlanta, GA: U.S. Department of Health and Human Services, Public Health Service

Report on Carcinogens, Eleventh Edition; U.S. Department of Health and Human Services, Public Health Service, National Toxicology Program, 2006. http://ntp.niehs.nih.gov/ntp/roc/toc11.html

Is there a medical test to show whether you have been exposed to PCE?

One way of testing for PCE exposure is to measure the amount of the chemical in the breath, much the same way breath-alcohol measurements are used to determine the amount of alcohol in the blood. Because PCE is stored in the body's fat and slowly released into the bloodstream, it can be detected in the breath for weeks following a heavy exposure. Also, PCE and trichloroacetic acid (TCA), a breakdown product of PCE, can be detected in the blood. These tests are relatively simple to perform but are not available at most doctors' offices and must be done at special laboratories that have the right equipment. Because exposure to other chemicals can produce the same breakdown products in the urine and blood, the tests for breakdown products cannot determine if you have been exposed to PCE or the other chemicals that produce the same breakdown chemicals.

What has the federal government made recommendations to protect human health?

The EPA maximum contaminant level for the amount of PCE that can be in drinking water is 0.005 milligrams PCE per liter of water (0.005 mg/L).

The Occupational Safety and Health Administration (OSHA) have set a limit of 100 ppm for an 8-hour workday over a 40-hour workweek.

The National Institute for Occupational Safety and Health (NIOSH) recommends that PCE be handled as a potential carcinogen and recommends that levels in workplace air should be as low as possible.

The Ohio Department of Health is in cooperative agreement with the Agency for Toxic Substances and Disease Registry (ATSDR), Public Health Service, U.S. Department of Health and Human Services.

This pamphlet was created by the Ohio Department of Health, Bureau of Environmental Health, Health Assessment Section and supported in whole by funds from the Cooperative Agreement Program grant from the ATSDR.

ATSDR
AGENCY FOR TOXIC SUBSTANCES AND DISEASE REGISTRY

Revised 08-21-06

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
CINCINNATI, OHIO 45268

October 1, 2007

Ex. 6 P... Names, Addresses and p... (Tenant)
Ex. 6 P... Names, Addresses and phone numbe...
Dayton, Ohio 45417

Dear Ms. Ex. 6 P... Nam...

The purpose of this letter is to inform you of the results of the sub-slab (the space under your basement floor) and indoor air samples collected from your building on April 26, 2007. As you know, these samples were collected to see if soil vapors from the Delphi plant were moving through the soils and entering the air inside your building. They were specifically tested for the presence of chloroform, trichloroethylene (also known as TCE) and tetrachloroethylene (also known as perchloroethylene or PCE), which have been detected under the neighborhood.

These chemicals are volatile organic compounds, which means they easily evaporate (turn from a liquid to a gas) when they are exposed to the soil or air. These chemicals have the potential, as vapors, to move through the soils and work their way into building substructures, such as basements, where they can accumulate in the indoor air.

The results for the samples collected at your building are presented below and are identified as "Detected." Both sub-slab and indoor air samples are measured in units called parts per billion (ppb). Following the result for each sample is the "screening level" for that chemical. The Ohio Department of Health (ODH) has recommended the screening levels for sub-slab and indoor air.

Ex. 6 P... Names, Addresses and phone numbers redacted **Sub-Slab Sampling Results:**
Detected: Chloroform at 200 ppb, ODH recommended screening level: 22 ppb
Detected: TCE at 110 ppb, ODH recommended screening level: 4 ppb
Detected: PCE at 180 ppb, ODH recommended screening level: 120 ppb

Ex. 6 P... Names, Addresses and phone numbers redacted **Indoor Air Sampling Results:**
Detected: Chloroform at 0.81 ppb, ODH recommended screening level: 2.2 ppb
Detected: TCE at 0.58 ppb, ODH recommended screening level: 0.4 ppb
Detected: PCE at 0.66 ppb, ODH recommended screening level: 12 ppb

The results from the **sub-slab sample** collected at your building show the chemicals chloroform, TCE, PCE were **found at levels higher** than the screening levels recommended by the ODH. The **indoor air sample** results show the chemical TCE was **found at a level higher** than the screening level recommended by the ODH.

Based on the laboratory results of the sub-slab and indoor air samples collected from your building, the U.S. EPA and ODH recommend that a vapor mitigation system be installed in your building to lower the levels of these chemicals in the indoor air. In

addition to installation of the system, the U.S. EPA and ODH recommend routine sampling at your building to ensure the mitigation system is working properly.

Delphi and the U.S. EPA are working together to address site contamination and to protect the community. We will be contacting you in the near future about installation of the mitigation system at your building.

If you have health-related questions concerning this matter, please contact Bob Frey at the Ohio Department of Health at 614-466-1069. If you have questions related to the sampling or the on-going site investigation, please feel free to contact me at 513-569-7539. You may contact Delphi directly at Delphi's toll-free information number at 1-866-4- DELPHI (1-866-433-5744).

Sincerely,

Steven L. Renninger
On-Scene Coordinator
U.S. EPA Region 5

Attachments: Analytical Results
ODH Fact Sheets (4)

cc: Site File

COLUMBIA ANALYTICAL SERVICES, INC.

RESULTS OF ANALYSIS

Client: Haley & Aldrich, Inc.
Client Sample ID: [redacted]-SS-1
Client Project ID: Home Ave SVI Investigation/26708-089

CAS Project ID: P2701235
CAS Sample ID: P2701235-003

Test Code: EPA TO-15
Instrument ID: Tekmar AUTOCAN/HP5972/HP5890 II+/MS2
Analyst: Chaney Humphrey
Sampling Media: Summa Canister
Test Notes:
Container ID: SC00078

Date Collected: 4/26/07
Date Received: 5/1/07
Date(s) Analyzed: 5/2/07
Volume(s) Analyzed: 0.15 Liter(s)

Pi 1 = -1.9 Pf 1 = 3.5

Can D.F. = 1.42

CAS #	Compound	Result µg/m³	MRL µg/m³	Result ppbV	MRL ppbV	Data Qualifier
74-87-3	Chloromethane	ND	9.5	ND	4.6	
75-01-4	Vinyl Chloride	ND	9.5	ND	3.7	
74-83-9	Bromomethane	ND	9.5	ND	2.4	
75-00-3	Chloroethane	ND	9.5	ND	3.6	
67-64-1	Acetone	560	47	240	20	M
75-69-4	Trichlorofluoromethane	ND	9.5	ND	1.7	
75-35-4	1,1-Dichloroethene	ND	9.5	ND	2.4	
75-09-2	Methylene chloride	ND	9.5	ND	2.7	
76-13-1	Trichlorotrifluoroethane	ND	9.5	ND	1.2	
75-15-0	Carbon Disulfide	ND	9.5	ND	3.0	
156-60-5	trans-1,2-Dichloroethene	ND	9.5	ND	2.4	
75-34-3	1,1-Dichloroethane	ND	9.5	ND	2.3	
1634-04-4	Methyl tert-Butyl Ether	ND	9.5	ND	2.6	
108-05-4	Vinyl Acetate	20	9.5	5.7	2.7	M
78-93-3	2-Butanone (MEK)	320	9.5	110	3.2	
156-59-2	cis-1,2-Dichloroethene	ND	9.5	ND	2.4	
67-66-3	Chloroform	960	9.5	200	1.9	
107-06-2	1,2-Dichloroethane	ND	9.5	ND	2.3	
71-55-6	1,1,1-Trichloroethane	35	9.5	6.4	1.7	
71-43-2	Benzene	25	9.5	7.9	3.0	
56-23-5	Carbon Tetrachloride	ND	9.5	ND	1.5	
78-87-5	1,2-Dichloropropane	ND	9.5	ND	2.0	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.
M = Matrix interference; results may be biased high.

Verified By: RC Date: 5/3/07

COLUMBIA ANALYTICAL SERVICES, INC.

RESULTS OF ANALYSIS

Client: Haley & Aldrich, Inc.
Client Sample ID: Ex. 6 P... Names,... SS-1
Client Project ID: Home Ave SVI Investigation/26708-089

CAS Project ID: P2701235
CAS Sample ID: P2701235-003

Test Code: EPA TO-15
Instrument ID: Tekmar AUTOCAN/HP5972/HP5890 II+/MS2
Analyst: Chaney Humphrey
Sampling Media: Summa Canister
Test Notes:
Container ID: SC00078

Date Collected: 4/26/07
Date Received: 5/1/07
Date(s) Analyzed: 5/2/07
Volume(s) Analyzed: 0.15 Liter(s)

Pi 1 = -1.9 Pf 1 = 3.5

Can D.F. = 1.42

CAS #	Compound	Result µg/m³	MRL µg/m³	Result ppbV	MRL ppbV	Data Qualifier
75-27-4	Bromodichloromethane	ND	9.5	ND	1.4	
79-01-6	Trichloroethene	610	9.5	110	1.8	
10061-01-5	cis-1,3-Dichloropropene	ND	9.5	ND	2.1	
108-10-1	4-Methyl-2-pentanone	24	9.5	6.0	2.3	
10061-02-6	trans-1,3-Dichloropropene	ND	9.5	ND	2.1	
79-00-5	1,1,2-Trichloroethane	ND	9.5	ND	1.7	
108-88-3	Toluene	45	9.5	12	2.5	
591-78-6	2-Hexanone	46	9.5	11	2.3	
124-48-1	Dibromochloromethane	ND	9.5	ND	1.1	
106-93-4	1,2-Dibromoethane	ND	9.5	ND	1.2	
127-18-4	Tetrachloroethene	ND	9.5	ND	1.4	
108-90-7	Chlorobenzene	ND	9.5	ND	2.1	
100-41-4	Ethylbenzene	ND	9.5	ND	2.2	
179601-23-1	*m,p*-Xylenes	18	9.5	4.1	2.2	
75-25-2	Bromoform	ND	9.5	ND	0.92	
100-42-5	Styrene	ND	9.5	ND	2.2	
95-47-6	o-Xylene	ND	9.5	ND	2.2	
79-34-5	1,1,2,2-Tetrachloroethane	ND	9.5	ND	1.4	
541-73-1	1,3-Dichlorobenzene	ND	9.5	ND	1.6	
106-46-7	1,4-Dichlorobenzene	ND	9.5	ND	1.6	
95-50-1	1,2-Dichlorobenzene	ND	9.5	ND	1.6	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

Verified By: RG Date: 5/3/07 RG

COLUMBIA ANALYTICAL SERVICES, INC.

RESULTS OF ANALYSIS

Client: Haley & Aldrich, Inc.
Client Sample ID: [redacted]-SS-1
Client Project ID: Home Ave SVI Investigation/26708-089

CAS Project ID: P2701235
CAS Sample ID: P2701235-005

Test Code: EPA TO-15
Instrument ID: Tekmar AUTOCAN/HP5972/HP5890 II+/MS2
Analyst: Chaney Humphrey
Sampling Media: Summa Canister
Test Notes:
Container ID: SC00772

Date Collected: 4/26/07
Date Received: 5/1/07
Date(s) Analyzed: 5/2 - 5/3/07
Volume(s) Analyzed: 1.00 Liter(s)
0.050 Liter(s)

Pi 1 = 0.0 Pf 1 = 3.5

Can D.F. = 1.24

CAS #	Compound	Result µg/m³	MRL µg/m³	Result ppbV	MRL ppbV	Data Qualifier
74-87-3	Chloromethane	ND	1.2	ND	0.60	
75-01-4	Vinyl Chloride	ND	1.2	ND	0.49	
74-83-9	Bromomethane	ND	1.2	ND	0.32	
75-00-3	Chloroethane	ND	1.2	ND	0.47	
67-64-1	Acetone	320	6.2	140	2.6	
75-69-4	Trichlorofluoromethane	1.5	1.2	0.26	0.22	
75-35-4	1,1-Dichloroethene	26	1.2	6.6	0.31	
75-09-2	Methylene chloride	ND	1.2	ND	0.36	
76-13-1	Trichlorotrifluoroethane	ND	1.2	ND	0.16	
75-15-0	Carbon Disulfide	ND	1.2	ND	0.40	
156-60-5	trans-1,2-Dichloroethene	ND	1.2	ND	0.31	
75-34-3	1,1-Dichloroethane	16	1.2	4.0	0.31	
1634-04-4	Methyl tert-Butyl Ether	3.8	1.2	1.1	0.34	
108-05-4	Vinyl Acetate	5.3	1.2	1.5	0.35	M
78-93-3	2-Butanone (MEK)	130	1.2	45	0.42	
156-59-2	cis-1,2-Dichloroethene	4.9	1.2	1.2	0.31	
67-66-3	Chloroform	270	1.2	56	0.25	
107-06-2	1,2-Dichloroethane	ND	1.2	ND	0.31	
71-55-6	1,1,1-Trichloroethane	350	1.2	64	0.23	
71-43-2	Benzene	2.6	1.2	0.82	0.39	
56-23-5	Carbon Tetrachloride	ND	1.2	ND	0.20	
78-87-5	1,2-Dichloropropane	ND	1.2	ND	0.27	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.
M = Matrix interference; results may be biased high.

Verified By: RL Date: 5/3/07

COLUMBIA ANALYTICAL SERVICES, INC.

RESULTS OF ANALYSIS

Client: Haley & Aldrich, Inc.
Client Sample ID: Ex. 6 P... Names...-SS-1
Client Project ID: Home Ave SVI Investigation/26708-089

CAS Project ID: P2701235
CAS Sample ID: P2701235-005

Test Code: EPA TO-15
Instrument ID: Tekmar AUTOCAN/HP5972/HP5890 II+/MS2
Analyst: Chaney Humphrey
Sampling Media: Summa Canister
Test Notes:
Container ID: SC00772

Date Collected: 4/26/07
Date Received: 5/1/07
Date(s) Analyzed: 5/2 - 5/3/07
Volume(s) Analyzed: 1.00 Liter(s)
0.050 Liter(s)

Pi 1 = 0.0 Pf 1 = 3.5

Can D.F. = 1.24

CAS #	Compound	Result µg/m³	MRL µg/m³	Result ppbV	MRL ppbV	Data Qualifier
75-27-4	Bromodichloromethane	**3.2**	1.2	**0.47**	0.19	
79-01-6	Trichloroethene	**280**	1.2	**52**	0.23	
10061-01-5	cis-1,3-Dichloropropene	ND	1.2	ND	0.27	
108-10-1	4-Methyl-2-pentanone	**11**	1.2	**2.7**	0.30	
10061-02-6	trans-1,3-Dichloropropene	ND	1.2	ND	0.27	
79-00-5	1,1,2-Trichloroethane	ND	1.2	ND	0.23	
108-88-3	Toluene	**8.7**	1.2	**2.3**	0.33	
591-78-6	2-Hexanone	**3.6**	1.2	**0.87**	0.30	
124-48-1	Dibromochloromethane	ND	1.2	ND	0.15	
106-93-4	1,2-Dibromoethane	ND	1.2	ND	0.16	
127-18-4	Tetrachloroethene	**1,200**	1.2	**180**	0.18	
108-90-7	Chlorobenzene	ND	1.2	ND	0.27	
100-41-4	Ethylbenzene	**1.6**	1.2	**0.38**	0.29	
179601-23-1	*m,p*-Xylenes	**6.1**	1.2	**1.4**	0.29	
75-25-2	Bromoform	ND	1.2	ND	0.12	
100-42-5	Styrene	ND	1.2	ND	0.29	
95-47-6	o-Xylene	**2.0**	1.2	**0.45**	0.29	
79-34-5	1,1,2,2-Tetrachloroethane	ND	1.2	ND	0.18	
541-73-1	1,3-Dichlorobenzene	ND	1.2	ND	0.21	
106-46-7	1,4-Dichlorobenzene	ND	1.2	ND	0.21	
95-50-1	1,2-Dichlorobenzene	ND	1.2	ND	0.21	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

Verified By: RC Date: 5/3/07

COLUMBIA ANALYTICAL SERVICES, INC.

RESULTS OF ANALYSIS

Client: Haley & Aldrich, Inc.
Client Sample ID: [redacted]-InA-1
Client Project ID: Home Ave SVI Investigation/26708-089

CAS Project ID: P2701235
CAS Sample ID: P2701235-004

Test Code: EPA TO-15
Instrument ID: Tekmar AUTOCAN/HP5972/HP5890 II+/MS2
Analyst: Chaney Humphrey
Sampling Media: Summa Canister
Test Notes:
Container ID: AC00635

Date Collected: 4/26/07
Date Received: 5/1/07
Date(s) Analyzed: 5/2/07
Volume(s) Analyzed: 1.00 Liter(s)

Pi 1 = -2.5 Pf 1 = 3.5

Can D.F. = 1.49

CAS #	Compound	Result µg/m³	MRL µg/m³	Result ppbV	MRL ppbV	Data Qualifier
74-87-3	Chloromethane	ND	1.5	ND	0.72	
75-01-4	Vinyl Chloride	ND	1.5	ND	0.58	
74-83-9	Bromomethane	ND	1.5	ND	0.38	
75-00-3	Chloroethane	ND	1.5	ND	0.56	
67-64-1	Acetone	**22**	7.5	**9.1**	3.1	**M**
75-69-4	Trichlorofluoromethane	ND	1.5	ND	0.27	
75-35-4	1,1-Dichloroethene	ND	1.5	ND	0.38	
75-09-2	Methylene chloride	ND	1.5	ND	0.43	
76-13-1	Trichlorotrifluoroethane	ND	1.5	ND	0.19	
75-15-0	Carbon Disulfide	ND	1.5	ND	0.48	
156-60-5	trans-1,2-Dichloroethene	ND	1.5	ND	0.38	
75-34-3	1,1-Dichloroethane	ND	1.5	ND	0.37	
1634-04-4	Methyl tert-Butyl Ether	ND	1.5	ND	0.41	
108-05-4	Vinyl Acetate	**2.7**	1.5	**0.77**	0.42	
78-93-3	2-Butanone (MEK)	**2.0**	1.5	**0.68**	0.51	
156-59-2	cis-1,2-Dichloroethene	ND	1.5	ND	0.38	
67-66-3	Chloroform	**3.9**	1.5	**0.81**	0.31	
107-06-2	1,2-Dichloroethane	ND	1.5	ND	0.37	
71-55-6	1,1,1-Trichloroethane	ND	1.5	ND	0.27	
71-43-2	Benzene	ND	1.5	ND	0.47	
56-23-5	Carbon Tetrachloride	ND	1.5	ND	0.24	
78-87-5	1,2-Dichloropropane	ND	1.5	ND	0.32	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.
M = Matrix interference; results may be biased high.

Verified By: RC Date: 5/3/07

COLUMBIA ANALYTICAL SERVICES, INC.

RESULTS OF ANALYSIS

Client: Haley & Aldrich, Inc.
Client Sample ID: Ex. 6 P... Names...-InA-1
Client Project ID: Home Ave SVI Investigation/26708-089

CAS Project ID: P2701235
CAS Sample ID: P2701235-004

Test Code: EPA TO-15
Instrument ID: Tekmar AUTOCAN/HP5972/HP5890 II+/MS2
Analyst: Chaney Humphrey
Sampling Media: Summa Canister
Test Notes:
Container ID: AC00635

Date Collected: 4/26/07
Date Received: 5/1/07
Date(s) Analyzed: 5/2/07
Volume(s) Analyzed: 1.00 Liter(s)

Pi 1 = -2.5 Pf 1 = 3.5
Can D.F. = 1.49

CAS #	Compound	Result µg/m³	MRL µg/m³	Result ppbV	MRL ppbV	Data Qualifier
75-27-4	Bromodichloromethane	ND	1.5	ND	0.22	
79-01-6	Trichloroethene	**3.1**	1.5	**0.58**	0.28	
10061-01-5	cis-1,3-Dichloropropene	ND	1.5	ND	0.33	
108-10-1	4-Methyl-2-pentanone	ND	1.5	ND	0.36	
10061-02-6	trans-1,3-Dichloropropene	ND	1.5	ND	0.33	
79-00-5	1,1,2-Trichloroethane	ND	1.5	ND	0.27	
108-88-3	Toluene	**3.2**	1.5	**0.85**	0.40	
591-78-6	2-Hexanone	ND	1.5	ND	0.36	
124-48-1	Dibromochloromethane	ND	1.5	ND	0.17	
106-93-4	1,2-Dibromoethane	ND	1.5	ND	0.19	
127-18-4	Tetrachloroethene	**1.6**	1.5	**0.23**	0.22	
108-90-7	Chlorobenzene	ND	1.5	ND	0.32	
100-41-4	Ethylbenzene	ND	1.5	ND	0.34	
179601-23-1	*m,p* -Xylenes	ND	1.5	ND	0.34	
75-25-2	Bromoform	ND	1.5	ND	0.14	
100-42-5	Styrene	ND	1.5	ND	0.35	
95-47-6	o-Xylene	ND	1.5	ND	0.34	
79-34-5	1,1,2,2-Tetrachloroethane	ND	1.5	ND	0.22	
541-73-1	1,3-Dichlorobenzene	ND	1.5	ND	0.25	
106-46-7	1,4-Dichlorobenzene	ND	1.5	ND	0.25	
95-50-1	1,2-Dichlorobenzene	ND	1.5	ND	0.25	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

Verified By: RL Date: 5/3/07

COLUMBIA ANALYTICAL SERVICES, INC.

RESULTS OF ANALYSIS

Client: Haley & Aldrich, Inc.
Client Sample ID: Ex. 6 P... Name...-InA-1
Client Project ID: Home Ave SVI Investigation/26708-089

CAS Project ID: P2701235
CAS Sample ID: P2701235-006

Test Code: EPA TO-15
Instrument ID: Tekmar AUTOCAN/HP5972/HP5890 II+/MS2
Analyst: Chaney Humphrey
Sampling Media: Summa Canister
Test Notes:
Container ID: AC00740

Date Collected: 4/26/07
Date Received: 5/1/07
Date(s) Analyzed: 5/2/07
Volume(s) Analyzed: 1.00 Liter(s)

Pi 1 = -5.0 Pf 1 = 3.5
Can D.F. = 1.88

CAS #	Compound	Result µg/m³	MRL µg/m³	Result ppbV	MRL ppbV	Data Qualifier
74-87-3	Chloromethane	ND	1.9	ND	0.91	
75-01-4	Vinyl Chloride	ND	1.9	ND	0.74	
74-83-9	Bromomethane	ND	1.9	ND	0.48	
75-00-3	Chloroethane	ND	1.9	ND	0.71	
67-64-1	Acetone	15	9.4	6.4	4.0	M
75-69-4	Trichlorofluoromethane	ND	1.9	ND	0.33	
75-35-4	1,1-Dichloroethene	ND	1.9	ND	0.47	
75-09-2	Methylene chloride	ND	1.9	ND	0.54	
76-13-1	Trichlorotrifluoroethane	ND	1.9	ND	0.25	
75-15-0	Carbon Disulfide	ND	1.9	ND	0.60	
156-60-5	trans-1,2-Dichloroethene	ND	1.9	ND	0.47	
75-34-3	1,1-Dichloroethane	ND	1.9	ND	0.46	
1634-04-4	Methyl tert-Butyl Ether	ND	1.9	ND	0.52	
108-05-4	Vinyl Acetate	ND	1.9	ND	0.53	
78-93-3	2-Butanone (MEK)	2.3	1.9	0.77	0.64	
156-59-2	cis-1,2-Dichloroethene	ND	1.9	ND	0.47	
67-66-3	Chloroform	ND	1.9	ND	0.39	
107-06-2	1,2-Dichloroethane	ND	1.9	ND	0.46	
71-55-6	1,1,1-Trichloroethane	ND	1.9	ND	0.34	
71-43-2	Benzene	ND	1.9	ND	0.59	
56-23-5	Carbon Tetrachloride	ND	1.9	ND	0.30	
78-87-5	1,2-Dichloropropane	ND	1.9	ND	0.41	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.
M = Matrix interference; results may be biased high.

Verified By: RC Date: 5/8/07

COLUMBIA ANALYTICAL SERVICES, INC.

RESULTS OF ANALYSIS

Client: Haley & Aldrich, Inc.
Client Sample ID: Ex. 6 P... Names...-InA-1
Client Project ID: Home Ave SVI Investigation/26708-089

CAS Project ID: P2701235
CAS Sample ID: P2701235-006

Test Code: EPA TO-15
Instrument ID: Tekmar AUTOCAN/HP5972/HP5890 II+/MS2
Analyst: Chaney Humphrey
Sampling Media: Summa Canister
Test Notes:
Container ID: AC00740

Date Collected: 4/26/07
Date Received: 5/1/07
Date(s) Analyzed: 5/2/07
Volume(s) Analyzed: 1.00 Liter(s)

Pi l = -5.0 Pf l = 3.5

Can D.F. = 1.88

CAS #	Compound	Result µg/m³	MRL µg/m³	Result ppbV	MRL ppbV	Data Qualifier
75-27-4	Bromodichloromethane	ND	1.9	ND	0.28	
79-01-6	Trichloroethene	ND	1.9	ND	0.35	
10061-01-5	cis-1,3-Dichloropropene	ND	1.9	ND	0.41	
108-10-1	4-Methyl-2-pentanone	ND	1.9	ND	0.46	
10061-02-6	trans-1,3-Dichloropropene	ND	1.9	ND	0.41	
79-00-5	1,1,2-Trichloroethane	ND	1.9	ND	0.34	
108-88-3	Toluene	ND	1.9	ND	0.50	
591-78-6	2-Hexanone	ND	1.9	ND	0.46	
124-48-1	Dibromochloromethane	ND	1.9	ND	0.22	
106-93-4	1,2-Dibromoethane	ND	1.9	ND	0.24	
127-18-4	Tetrachloroethene	4.5	1.9	0.66	0.28	
108-90-7	Chlorobenzene	ND	1.9	ND	0.41	
100-41-4	Ethylbenzene	ND	1.9	ND	0.43	
179601-23-1	*m,p*-Xylenes	ND	1.9	ND	0.43	
75-25-2	Bromoform	ND	1.9	ND	0.18	
100-42-5	Styrene	ND	1.9	ND	0.44	
95-47-6	o-Xylene	ND	1.9	ND	0.43	
79-34-5	1,1,2,2-Tetrachloroethane	ND	1.9	ND	0.27	
541-73-1	1,3-Dichlorobenzene	ND	1.9	ND	0.31	
106-46-7	1,4-Dichlorobenzene	ND	1.9	ND	0.31	
95-50-1	1,2-Dichlorobenzene	ND	1.9	ND	0.31	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

Verified By: RC Date: 5/3/07

Bureau of
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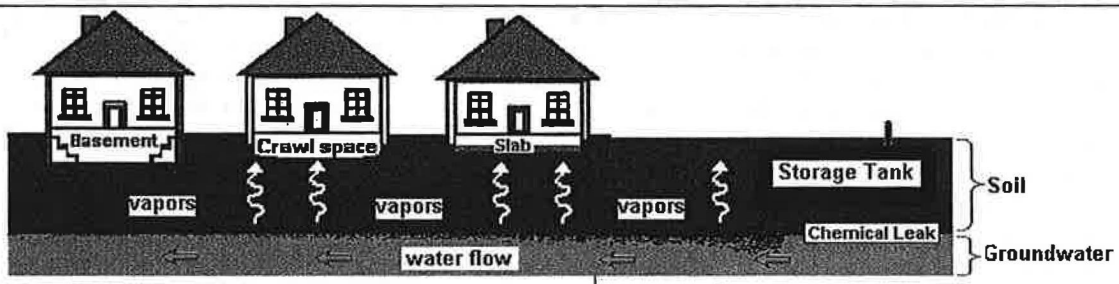
Vapor Intrusion

Answers to Frequently Asked Health Questions



What is vapor intrusion?

Vapor intrusion refers to the vapors produced by a chemical spill/leak that make their way into indoor air. When chemicals are spilled on the ground or leak from an underground storage tank, they will seep into the soils and will sometimes make their way into the groundwater (underground drinking water). There are a group of chemicals called volatile organic compounds (VOCs) that easily produce vapors. These vapors can travel through soils, especially if the soils are sandy and loose or have a lot of cracks (fissures). These vapors can then enter a home through cracks in the foundation or into a basement with a dirt floor or concrete slab.

VOCs and vapors:

VOCs can be found in petroleum products such as gasoline or diesel fuels, in solvents used for industrial cleaning and are also used in dry cleaning. If there is a large spill or leak resulting in soil or groundwater contamination, vapor intrusion may be possible and should be considered a potential public health concern that may require further investigation.

Although large spills or leaks are a public health concern, other sources of VOCs are found in everyday household products and are a more common source of poor indoor air quality. Common products such as paint, paint strippers and thinners, hobby supplies (glues), solvents, stored fuels (gasoline or home heating fuel), aerosol sprays, new carpeting or furniture, cigarette smoke, moth balls, air fresheners and dry-cleaned clothing all contain VOCs.

Can you get sick from vapor intrusion?

You can get sick from breathing harmful chemical vapors. But getting sick will depend on:
How much you were exposed to (dose).
How long you were exposed (duration).
How often you were exposed (frequency).
How toxic the spill/leak chemicals are.
General Health, age, lifestyle: Young children, the elderly and people with chronic (on-going) health problems are more at risk to chemical exposures.

VOC vapors at high levels can cause a strong petroleum or solvent odor and some persons may experience eye and respiratory irritation, headache and/or nausea (upset stomach). These symptoms are usually temporary and go away when the person is moved to fresh air.

Lower levels of vapors may go unnoticed and a person may feel no health effects. A few individual VOCs are known carcinogens (cause cancer). Health officials are concerned with low-level chemical exposures that happen over many years and may raise a person's lifetime risk for developing cancer.

How is vapor intrusion investigated?

In most cases, collecting soil gas or groundwater samples near the spill site is done first to see if there is on-site contamination. If soil vapors or groundwater contamination are detected at a spill site, environmental protection and public health officials may then ask that soil vapor samples be taken from areas outside the immediate spill site and near any potential affected business or home. The Ohio Department of Health (ODH) does not usually recommend indoor air sampling for vapor intrusion before the on-site contamination is determined.

(continued on next page)

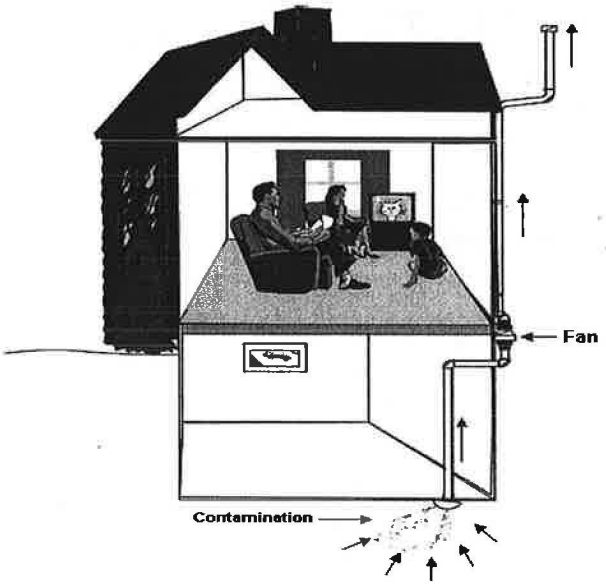
How is vapor intrusion investigated? (continued)

Because a variety of VOC sources are present in most homes, testing will not necessarily confirm VOCs in the indoor air are from VOC contamination in soils at nearby spill site. But if additional sampling is recommended, samples may be taken from beneath the home's foundation (called sub-slab samples), to see if vapors have reached the home. Sub-slab samples are more reliable than indoor air samples and are not as affected by other indoor chemical sources. If there was a need for additional sampling on a private property, homeowners would be contacted by the cleanup contractor or others working on the cleanup site and their cooperation and consent would be requested before any testing/sampling would be done.

What happens if a vapor intrusion problem is found?

If vapor intrusion is having an effect on the air in your home, the most common solution is to install a *radon mitigation system*. A radon mitigation system will prevent gases in the soil from entering the home. A low amount of suction is applied below the foundation and the vapors are vented to the outside. The system uses minimal electricity and should not noticeably affect heating and cooling efficiency. This mitigation system also prevents radon from entering the home, an added health benefit. Usually, the party responsible for cleaning up the contamination is also responsible for paying for the installation of this system. Once the contamination is cleaned up, the system should no longer be needed. In homes with on going radon problems, ODH suggests these systems remain in place permanently.

Radon Mitigation System



What can you do to improve your indoor air quality?

As stated before, the most likely source of VOCs in indoor air comes from the common items that are found in most homes. The following helpful hints will help improve air quality inside your home:

- Do not buy more chemicals than you need and know what products contain VOCs.
- If you have a garage or an out building such as a shed, place the properly stored VOC-containing chemicals outside and away from your family living areas.
- Immediately clean and ventilate any VOC spill area.
- If you smoke, go outside and/or open the windows to ventilate the second-hand, VOC-containing smoke outdoors.
- Make sure all your major appliances and fireplace(s) are in good condition and not leaking harmful VOC vapors. Fix all appliance and fireplace leaks promptly, as well as other leaks that cause moisture problems that encourage mold growth.
- Most VOCs are a fire hazard. Make sure these chemicals are stored in appropriate containers and in a well-ventilated location and away from an open pilot light (flame) of a gas water heater or furnace.
- Fresh air will help prevent both build up of chemical vapors in the air and mold growth. Occasionally open the windows and doors and ventilate.
- Test your home for radon and install a radon detector.

References:

Wisconsin Department of Health and Family Services, Environmental Health Resources, Vapor Intrusion, electronic, 2004.

New York State Department of Health, Center for Environmental Health, April 2003.

Ohio Department of Health, Bureau of Environmental Health, Indoor Environment Program, 2004.

For more information contact:

Ohio Department of Health
Bureau of Environmental Health
Health Assessment Section
246 N. High Street
Columbus, Ohio 43215
Phone: (614) 466-1390
Fax: (614) 466-4556

Created September 2004

Bureau of Environmental Health
Health Assessment Section
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Chloroform

Answers to Frequently Asked Health Questions

What is chloroform?

Chloroform, also called trichloromethane or methyltrichloride, is a colorless liquid with a pleasant, non-irritating odor and a slightly sweet taste. As a volatile organic compound (VOC), chloroform easily vaporizes (turns into a gas) in the air. Chloroform does not easily burn, but it will burn when it reaches very high temperatures. Chloroform was one of the first inhaled anesthetics to be used during surgery, but it is not used as an anesthesia today.

Where do you find chloroform?

In order to destroy the harmful bacteria found in our drinking water and waste waters, the chemical chlorine is added to these water sources. As a by-product of adding chlorine to our drinking and waste waters, small amounts of chloroform are formed. So small amounts of chloroform are likely to be found almost everywhere.

In industry, nearly all the chloroform made in the U.S. is used to make other chemicals. From the factories that make or use this chemical, chloroform can enter the air directly or it can enter the air from the evaporation (changing from liquid to a gas) of chloroform-contaminated waters and soils. Chloroform can also enter the water and soils from industry storage and waste sites spills and leaks.

Not only does chloroform evaporate very quickly when exposed to air, it also dissolves easily in water and does not stick to the soils very well. This means chloroform can easily travel through the soils to groundwater, where it can enter a water supply. Chloroform lasts a long time in both the air and in groundwater. Most of the chloroform in the air eventually breaks down, but it is a slow process. Chloroform does not appear to build up in great amounts in plants and animals, but we may find some small amounts of chloroform in foods.

How do you come in contact with chloroform? Who is more at risk?

You are most likely to be exposed to chloroform by drinking contaminated water and/or by breathing contaminated indoor or outdoor air. Chloroform is found in nearly all public drinking water supplies. Chloroform is also found in the air from all areas of the United States. You are probably exposed to small amounts of chloroform in your drinking water and/or in beverages that are made using water that contains chloroform.

People who are at greater risk to be exposed to chloroform at higher-than-normal levels are people who work at or near chemical plants and factories that make or use chloroform. Higher exposures might occur in workers at drinking water treatment plants, waste water treatment plants, and paper and pulp mills. People who operate waste-burning equipment may also be exposed to higher than normal levels. People who swim a lot in swimming pools may also be exposed to higher levels.

How does chloroform enter and leave your body?

- Chloroform can enter your body if you breathe contaminated air (inhalation)
- Chloroform can enter your body if you eat/drink contaminated food or water (ingestion)
- Chloroform can also enter your body through the skin (dermal).

If you take a bath, shower or swim in a pool with chloroform-contaminated water, it can enter your body through inhalation and dermal contact.

Studies in humans and animals show that after you breathe contaminated air or eat contaminated food, the chloroform can quickly enter your bloodstream from your lungs and intestines. Inside your body, chloroform is carried by the blood to all parts of your body, such as the liver, kidneys and fat cells.

Some of the chloroform that enters your body leaves unchanged in the air you breathe out and some of it is broken down into other chemicals. These chemicals are known as breakdown products or metabolites, and some of them can attach to other chemicals inside the cells of your body and may cause harmful effects if they collect in high enough amounts in your body. Some of the metabolites will leave the body in the air you breathe out and small amounts of the breakdown products leave the body in the urine and stool.

How does chloroform affect health?

In humans, large amounts of chloroform can affect the central nervous system (brain), liver and kidneys. Breathing high levels for a short time can cause fatigue, dizziness, and headache. If you breathe air, eat food, or drink water containing elevated levels of chloroform, over a long period, the chloroform may damage your liver and kidneys. Large amounts of chloroform can cause sores (lesions) when the chloroform touches your skin.

Lab studies have shown chloroform caused reproductive problems in animals (mice and rats). However, there is no evidence that show whether chloroform causes harmful reproductive effects or birth defects in humans.

Does chloroform cause cancer?

Based on animal studies, the Department of Health and Human Services (DHHS) has determined that chloroform may reasonably be anticipated to be a carcinogen (a substance that causes cancer). The International Agency for Research on Cancer (IARC) has determined that chloroform is possibly carcinogenic to humans (2B). The EPA has also determined that chloroform is a "probable" human carcinogen.

Results of studies of people who drank chlorinated water showed a possible link between the chloroform in the chlorinated water and the occurrence of cancer of the colon and urinary bladder. Rats and mice that ate food or drank water that had large amounts of chloroform in it for a long period of time developed cancer of the liver and kidneys. However, there is no evidence that shows whether chloroform causes liver and kidney cancer in humans.

Is there a medical test to show whether you have been exposed to chloroform?

Although we can measure the amount of chloroform in the air you breathe out and in blood, urine, and body tissues, we have no reliable test to determine how much chloroform you have been exposed to or whether you will experience any harmful health effects.

The measurement of chloroform in body fluids and tissues may help to determine if you have come into contact with large amounts of chloroform. However, these tests are useful only a short time after you are exposed to chloroform because it leaves the body quickly.

What has been done to protect human health?

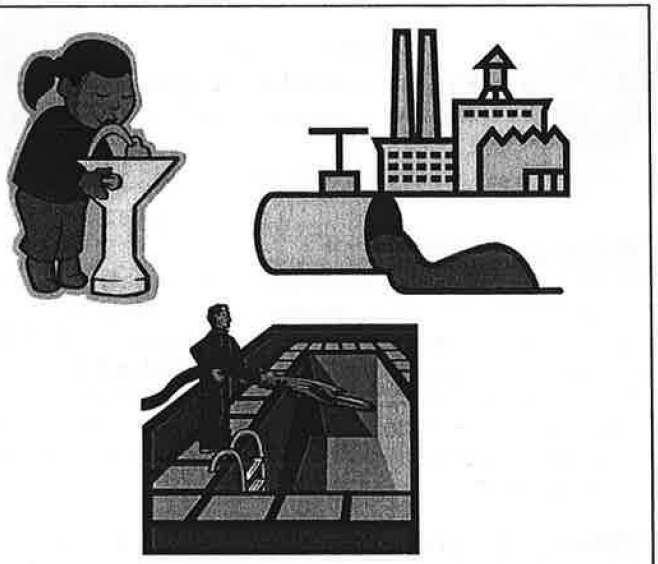
The amount of chloroform normally expected to be in the air ranges from 0.02 to 0.05 parts of chloroform per billion parts (ppb) of air and from 2 to 44 ppb in treated drinking water.

Notes: The below unit of measurement will be found in the ppb (parts per billion) range. Examples: One part per billion (1 ppb) would be equal to having one bean in a pile of one billion beans, or one ppb would be equal to one second of time in 32 years.

The Environmental Protection Agency (EPA) has set the level of chloroform in drinking water at 80 ppb.

The Occupational Safety and Health Administration (OSHA) has set a permissible 50,000 ppb exposure limit of air in the workplace during an 8-hour workday, 40-hour week.

The EPA requires chloroform spills or accidental releases into the environment of 10 pounds or more of be reported to the EPA.



For more information contact:

Ohio Department of Health
Bureau of Environmental Health
Health Assessment Section
246 N. High Street
Columbus, Ohio 43215
Phone: (614) 466-1390
Fax: (614) 466-4556

Reference:

Agency for Toxic Substances and Disease Registry (ATSDR). 1997. Toxicological profile for chloroform. Atlanta, GA: U.S. Department of Health and Human Services, Public Health Service.

The Ohio Department of Health is in cooperative agreement with the Agency for Toxic Substances and Disease Registry (ATSDR), Public Health Service, U.S. Department of Health and Human Services.

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ATSDR
AGENCY FOR TOXIC SUBSTANCES AND DISEASE REGISTRY

Created 04/10/07

Bureau of
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Health Assessment Section

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Trichloroethylene (TCE)

(try- klor'oh eth'uh- leen)

Answers to Frequently Asked Health Questions

What is TCE?

TCE is man-made chemical that is not found naturally in the environment. TCE is a non-flammable (does not burn), colorless liquid with a somewhat sweet odor and has a sweet, "burning" taste. It is mainly used as a cleaner to remove grease from metal parts. TCE can also be found in glues, paint removers, typewriter correction fluids and spot removers.

The biggest source of TCE in the environment comes from evaporation (changing from a liquid into a vapor/gas) when industries use TCE to remove grease from metals. But TCE also enters the air when we use common household products that contain TCE. It can also enter the soil and water as the result of spills or improper disposal.

What happens to TCE in the environment?

- TCE will quickly evaporate from the surface waters of rivers, lakes, streams, creeks and puddles.
- If TCE is spilled on the ground, some of it will evaporate and some of it may leak down into the ground. When it rains, TCE can sink through the soils and into the ground (underground drinking) water.
- When TCE is in an oxygen-poor environment and with time, it will break down into different chemicals such as 1,2 Dichloroethene and Vinyl Chloride.
- TCE does not build up in plants and animals.
- The TCE found in foods is believed to come from TCE contaminated water used in food processing or from food processing equipment cleaned with TCE.

How does TCE get into your body?

- TCE can get into your body by breathing (inhalation) air that is polluted with TCE vapors. The vapors can be produced from the manufacturing of TCE, from TCE polluted water evaporating in the shower or by using household products such as spot removers and typewriter correction fluid.
- TCE can get into your body by drinking (ingestion) TCE polluted water.
- Small amounts of TCE can get into your body through skin (dermal) contact. This can take place when using TCE as a cleaner to remove grease from metal parts or by contact with TCE polluted soils.

Can TCE make you sick?

Yes, you can get sick from TCE. But getting sick will depend on the following:

- How much you were exposed to (dose).
- How long you were exposed (duration).
- How often you were exposed (frequency).
- General Health, Age, Lifestyle Young children, the elderly and people with chronic (on-going) health problems are more at risk to chemical exposures.

How does TCE affect your health?

Breathing (Inhalation):

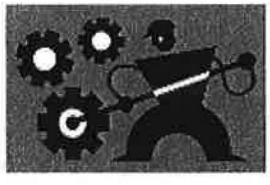
- Breathing high levels of TCE may cause headaches, lung irritation, dizziness, poor coordination (clumsy) and difficulty concentrating.
- Breathing very high levels of TCE for long periods may cause nerve, kidney and liver damage.

Drinking (Ingestion):

- Drinking high concentrations of TCE in the water for long periods may cause liver and kidney damage, harm immune system functions and damage fetal development in pregnant women (although the extent of some of these effects is not yet clear).
- It is uncertain whether drinking low levels of TCE will lead to adverse health effects.

Skin (Dermal) Contact:

- Short periods of skin contact with high levels of TCE may cause skin rashes.



Does TCE cause cancer?

The National Toxicology Program's 11th Report on Carcinogens places chemicals into one of two cancer-causing categories: *Known to be Human Carcinogens* and *Reasonably Anticipated to be Human Carcinogens.*

The11th Report on Carcinogens states TCE is *"Reasonably Anticipated to be Human Carcinogen."*

The category *"Reasonably Anticipated to be Human Carcinogen"* gathers evidence mainly from animal studies. There may be limited human studies or there may be no human or animal study evidence to support carcinogenicity; but the agent, substance or mixture belongs to a well-defined class of substances that are known to be carcinogenic.

There are human studies of communities that were exposed to high levels of TCE in drinking water and they have found evidence of increased leukemia's. But the residents of these communities were also exposed to other solvents and may have had other risk factors associated with this type of cancer.

Animal lab studies in mice and rats have suggested that high levels of TCE may cause liver, lung, kidney and blood (lymphoma) cancers.

As part of the National Exposure Subregistry, the Agency for Toxic Substances and Disease Registry (ATSDR) compiled data on 4,280 residents of three states (Michigan, Illinois, and Indiana) who had environmental exposure to TCE. ATSDR found no definitive evidence for an excess of cancers from these TCE exposures.

The U.S. EPA is currently reviewing the carcinogenicity of TCE.

Is there a medical test to show whether you have been exposed to TCE?

If you have recently been exposed to TCE, it can be detected in your breath, blood, or urine. The breath test, if done soon after exposure, can tell if you have been exposed to even a small amount of TCE.

Exposure to larger amounts is measured in blood and urine tests. These tests detect TCE and many of its breakdown products for up to a week after exposure. However, exposure to other similar chemicals can produce the same breakdown products in the blood and urine so the detection of the breakdown products is not absolute proof of exposure to TCE.

These tests aren't available at most doctors' offices, but can be done at special laboratories that have the right equipment. **Note:** Tests can determine if you have been exposed to TCE but cannot predict if you will experience adverse health effects from the exposure.

Has the federal government made recommendations to protect human health?

The federal government develops regulations and recommendations to protect public health and these regulations can be enforced by law.

Recommendations and regulations are periodically updated as more information becomes available. Some regulations and recommendations for TCE follow:

- The Environmental Protection Agency (EPA) has set a maximum contaminant level for TCE in drinking water at 0.005 milligrams per liter (0.005 mg/L) or 5 parts of TCE per billion parts water (5 ppb).
- The Occupational Safety and Health Administration (OSHA) have set an exposure limit of 100 ppm (or 100 parts of TCE per million parts of air) for an 8-hour workday, 40-hour workweek.
- The EPA has developed regulations for the handling and disposal of TCE.

References

Agency for Toxic Substances and Disease Registry (ATSDR). 1997. Toxicological profile for TCE (electronic at **http://www.atsdr.cdc.gov/tfacts19.html**)

Report on Carcinogens, Eleventh Edition; U.S. Department of Health and Human Services, Public Health Service, National Toxicology Program, 2005 (2005 electronic at **http://ntp.niehs.nih.gov/ntp/roc/toc11.html**)

The Ohio Department of Health is in cooperative agreement with the Agency for Toxic Substances and Disease Registry (ATSDR), Public Health Service, U.S. Department of Health and Human Services.

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Tetrachloroethylene (PCE)

Other names for tetrachloroethylene include PCE, perchloroethylene, PERC or tetrachloroethene.

What is PCE?

Tetrachloroethylene (also known as PCE, PERC or perchloroethylene) is a man-made chemical that is widely used for dry cleaning clothes and degreasing metal. It is also used to make other chemicals and can be found in some household products such as water repellents, silicone lubricants, spot removers, adhesives and wood cleaners. It easily evaporates (turn from a liquid to a gas) into the air and has a sharp, sweet odor. PCE is a nonflammable (does not burn) liquid at room temperature.

How does PCE get into the environment?

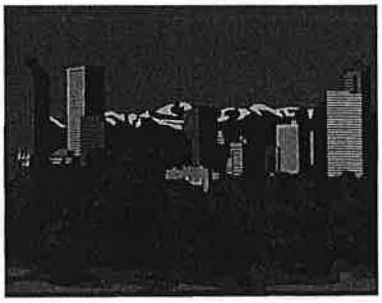
PCE can evaporate into the air during dry cleaning operations and during industrial use. It can also evaporate into the air if it is not properly stored or was spilled. If it was spilled or leaked on the ground, it may find its way into groundwater (underground drinking water).

People can be exposed to PCE from the environment from household products, from dry cleaning products and from their occupation (work). Common environmental levels of PCE (called background levels) can be found in the air we breathe, in the water we drink and in the food we eat. In general, levels in the air are higher in the cities or around industrial areas where it is used more than rural or remote areas.

The people with the greatest chance of exposure to PCE are those who work with it. According to estimates from a survey conducted by the National Institute for Occupational Safety and Health (NIOSH), more than 650,000 U.S. workers may be exposed. However, the air close to dry cleaning business and industrial sites may have levels of PCE higher than background levels. If the dry cleaning business or industry has spilled or leaked PCE on the ground, there may also be contaminated groundwater as well.

What happens to PCE in the environment?

Much of the PCE that gets into surface waters or soil evaporates into the air. However, some of the PCE may make its way to the groundwater. Microorganisms can break down some of the PCE in soil or underground water. In the air, it is broken down by sunlight into other chemicals or brought back to the soil and water by rain. PCE does not appear to collect in fish or other animals that live in water.



How can PCE enter and leave my body?

PCE can enter your body when you breathe contaminated air or when you drink water or eat food contaminated with the chemical. If PCE is trapped against your skin, a small amount of it can pass through into your body. Very little PCE in the air can pass through your skin into your body. Breathing contaminated air and drinking water are the two most likely ways people will be exposed to PCE. How much enters your body depends on how much of the chemical is in the air, how fast and deeply you are breathing, how long you are exposed to it or how much of the chemical you eat or drink.

Most PCE leaves your body from your lungs when you breathe out. This is true whether you take in the chemical by breathing, drinking, eating, or touching it. A small amount is changed by your body (in your liver) into other chemicals that are removed from your body in urine. Most of the changed PCE leaves your body in a few days. Some of it that you take in is found in your blood and other tissues, especially body fat. Part of the PCE that is stored in fat may stay in your body for several days or weeks before it is eliminated.

Can PCE make you sick?

Yes, you can get sick from contact with PCE. But getting sick will depend upon:

- How much you were exposed to (dose).
- How long you were exposed (duration).
- How often you were exposed (frequency).
- General Health, Age, Lifestyle Young children, the elderly and people with chronic (on-going) health problems are more at risk to chemical exposures.

How can PCE affect my health?

Exposure to very high concentrations of PCE (particularly in closed, poorly ventilated areas) can cause dizziness, headache, sleepiness, confusion, nausea, difficulty in speaking and walking, unconsciousness and even death. Skin irritation may result from repeated or extended contact with it as well. These symptoms occur almost entirely in work (or hobby) environments when people have been accidentally exposed to high concentrations or have intentionally used PCE to get a "high." Normal background levels (or common environmental levels) will not cause these health affects.

Does PCE cause cancer (carcinogen)?

In the United States, the National Toxicology Program (NTP) releases the *Report on Carcinogens* (RoC) every two years. The *Report on Carcinogens* (RoC) identifies two groups of agents: "Known to be human carcinogens" & "Reasonably anticipated to be human carcinogens."

PCE has been shown to cause liver tumors in mice and kidney tumors in male rats. There is limited evidence for the carcinogenicity of PCE in humans. PCE has been studied by observing laundry and dry-cleaning workers, who may also have been exposed to other solvents, especially trichloroethylene (TCE), but also petroleum solvents.

The *Eleventh Report on Carcinogens* (RoC) has determined that PCE may reasonably be anticipated to be a carcinogen.

Reference:

Agency for Toxic Substances and Disease Registry (ATSDR). 1997. Toxicological Profile for tetrachloroethylene. Atlanta, GA: U.S. Department of Health and Human Services, Public Health Service

Report on Carcinogens, Eleventh Edition; U.S. Department of Health and Human Services, Public Health Service, National Toxicology Program, 2006. http://ntp.niehs.nih.gov/ntp/roc/toc11.html

Is there a medical test to show whether you have been exposed to PCE?

One way of testing for PCE exposure is to measure the amount of the chemical in the breath, much the same way breath-alcohol measurements are used to determine the amount of alcohol in the blood. Because PCE is stored in the body's fat and slowly released into the bloodstream, it can be detected in the breath for weeks following a heavy exposure. Also, PCE and trichloroacetic acid (TCA), a breakdown product of PCE, can be detected in the blood. These tests are relatively simple to perform but are not available at most doctors' offices and must be done at special laboratories that have the right equipment. Because exposure to other chemicals can produce the same breakdown products in the urine and blood, the tests for breakdown products cannot determine if you have been exposed to PCE or the other chemicals that produce the same breakdown chemicals.

What has the federal government made recommendations to protect human health?

The EPA maximum contaminant level for the amount of PCE that can be in drinking water is 0.005 milligrams PCE per liter of water (0.005 mg/L).

The Occupational Safety and Health Administration (OSHA) have set a limit of 100 ppm for an 8-hour workday over a 40-hour workweek.

The National Institute for Occupational Safety and Health (NIOSH) recommends that PCE be handled as a potential carcinogen and recommends that levels in workplace air should be as low as possible.

The Ohio Department of Health is in cooperative agreement with the Agency for Toxic Substances and Disease Registry (ATSDR), Public Health Service, U.S. Department of Health and Human Services.

This pamphlet was created by the Ohio Department of Health, Bureau of Environmental Health, Health Assessment Section and supported in whole by funds from the Cooperative Agreement Program grant from the ATSDR.

ATSDR
AGENCY FOR TOXIC SUBSTANCES AND DISEASE REGISTRY

Revised 08-21-06

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
CINCINNATI, OHIO 45268

October 1, 2007

Ex. 6 P... Names, Addresses and phone num...
Ex. 6 P... Names, Addresses and phone numbe...
Dayton, Ohio 45417

Dear Ex. 6 P... Na...

The purpose of this letter is to inform you of the results of the sub-slab (the space under your basement floor) and indoor air samples collected from your building on April 26, 2007. As you know, these samples were collected to see if soil vapors from the Delphi plant were moving through the soils and entering the air inside your building. They were specifically tested for the presence of chloroform, trichloroethylene (also known as TCE) and tetrachloroethylene (also known as perchloroethylene or PCE), which have been detected under the neighborhood.

These chemicals are volatile organic compounds, which means they easily evaporate (turn from a liquid to a gas) when they are exposed to the soil or air. These chemicals have the potential, as vapors, to move through the soils and work their way into building substructures, such as basements, where they can accumulate in the indoor air.

The results for the samples collected at your building are presented below and are identified as "Detected." Both sub-slab and indoor air samples are measured in units called parts per billion (ppb). Following the result for each sample is the "screening level" for that chemical. The Ohio Department of Health (ODH) has recommended the screening levels for sub-slab and indoor air.

Ex. 6 P... Names, Addresses and phone numbers redacted **Sub-Slab Sampling Results:**
Detected: Chloroform at 200 ppb, ODH recommended screening level: 22 ppb
Detected: TCE at 110 ppb, ODH recommended screening level: 4 ppb
Detected: PCE at 180 ppb, ODH recommended screening level: 120 ppb

Ex. 6 P... Names, Addresses and phone numbers redacted **Indoor Air Sampling Results:**
Detected: Chloroform at 0.81 ppb, ODH recommended screening level: 2.2 ppb
Detected: TCE at 0.58 ppb, ODH recommended screening level: 0.4 ppb
Detected: PCE at 0.66 ppb, ODH recommended screening level: 12 ppb

The results from the **sub-slab sample** collected at your building show the chemicals chloroform, TCE, PCE were **found at levels higher** than the screening levels recommended by the ODH. The **indoor air sample** results show the chemical TCE was **found at a level higher** than the screening level recommended by the ODH.

Based on the laboratory results of the sub-slab and indoor air samples collected from your building, the U.S. EPA and ODH recommend that a vapor mitigation system be installed in your building to lower the levels of these chemicals in the indoor air. In

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
CINCINNATI, OHIO 45268

addition to installation of the system, the U.S. EPA and ODH recommend routine sampling at your building to ensure the mitigation system is working properly.

Delphi and the U.S. EPA are working together to address site contamination and to protect the community. We will be contacting you in the near future about installation of the mitigation system at your building.

If you have health-related questions concerning this matter, please contact Bob Frey at the Ohio Department of Health at 614-466-1069. If you have questions related to the sampling or the on-going site investigation, please feel free to contact me at 513-569-7539. You may contact Delphi directly at Delphi's toll-free information number at 1-866-4- DELPHI (1-866-433-5744).

Sincerely,

Steven L. Renninger
On-Scene Coordinator
U.S. EPA Region 5

Attachments: Analytical Results
ODH Fact Sheets (4)

cc: Site File

COLUMBIA ANALYTICAL SERVICES, INC.

RESULTS OF ANALYSIS

Client: Haley & Aldrich, Inc.
Client Sample ID: [redacted]-SS-1
Client Project ID: Home Ave SVI Investigation/26708-089

CAS Project ID: P2701235
CAS Sample ID: P2701235-003

Test Code: EPA TO-15
Instrument ID: Tekmar AUTOCAN/HP5972/HP5890 II+/MS2
Analyst: Chaney Humphrey
Sampling Media: Summa Canister
Test Notes:
Container ID: SC00078

Date Collected: 4/26/07
Date Received: 5/1/07
Date(s) Analyzed: 5/2/07
Volume(s) Analyzed: 0.15 Liter(s)

Pi 1 = -1.9 Pf 1 = 3.5

Can D.F. = 1.42

CAS #	Compound	Result µg/m³	MRL µg/m³	Result ppbV	MRL ppbV	Data Qualifier
74-87-3	Chloromethane	ND	9.5	ND	4.6	
75-01-4	Vinyl Chloride	ND	9.5	ND	3.7	
74-83-9	Bromomethane	ND	9.5	ND	2.4	
75-00-3	Chloroethane	ND	9.5	ND	3.6	
67-64-1	Acetone	560	47	240	20	M
75-69-4	Trichlorofluoromethane	ND	9.5	ND	1.7	
75-35-4	1,1-Dichloroethene	ND	9.5	ND	2.4	
75-09-2	Methylene chloride	ND	9.5	ND	2.7	
76-13-1	Trichlorotrifluoroethane	ND	9.5	ND	1.2	
75-15-0	Carbon Disulfide	ND	9.5	ND	3.0	
156-60-5	trans-1,2-Dichloroethene	ND	9.5	ND	2.4	
75-34-3	1,1-Dichloroethane	ND	9.5	ND	2.3	
1634-04-4	Methyl tert-Butyl Ether	ND	9.5	ND	2.6	
108-05-4	Vinyl Acetate	20	9.5	5.7	2.7	M
78-93-3	2-Butanone (MEK)	320	9.5	110	3.2	
156-59-2	cis-1,2-Dichloroethene	ND	9.5	ND	2.4	
67-66-3	Chloroform	960	9.5	200	1.9	
107-06-2	1,2-Dichloroethane	ND	9.5	ND	2.3	
71-55-6	1,1,1-Trichloroethane	35	9.5	6.4	1.7	
71-43-2	Benzene	25	9.5	7.9	3.0	
56-23-5	Carbon Tetrachloride	ND	9.5	ND	1.5	
78-87-5	1,2-Dichloropropane	ND	9.5	ND	2.0	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.
M = Matrix interference; results may be biased high.

Verified By: RC Date: 5/3/07

COLUMBIA ANALYTICAL SERVICES, INC.

RESULTS OF ANALYSIS

Client: Haley & Aldrich, Inc.
Client Sample ID: [redacted]-1
Client Project ID: Home Ave SVI Investigation/26708-089

CAS Project ID: P2701235
CAS Sample ID: P2701235-003

Test Code: EPA TO-15
Instrument ID: Tekmar AUTOCAN/HP5972/HP5890 II+/MS2
Analyst: Chaney Humphrey
Sampling Media: Summa Canister
Test Notes:
Container ID: SC00078

Date Collected: 4/26/07
Date Received: 5/1/07
Date(s) Analyzed: 5/2/07
Volume(s) Analyzed: 0.15 Liter(s)

Pi l = -1.9 Pf l = 3.5
Can D.F. = 1.42

CAS #	Compound	Result µg/m³	MRL µg/m³	Result ppbV	MRL ppbV	Data Qualifier
75-27-4	Bromodichloromethane	ND	9.5	ND	1.4	
79-01-6	Trichloroethene	610	9.5	110	1.8	
10061-01-5	cis-1,3-Dichloropropene	ND	9.5	ND	2.1	
108-10-1	4-Methyl-2-pentanone	24	9.5	6.0	2.3	
10061-02-6	trans-1,3-Dichloropropene	ND	9.5	ND	2.1	
79-00-5	1,1,2-Trichloroethane	ND	9.5	ND	1.7	
108-88-3	Toluene	45	9.5	12	2.5	
591-78-6	2-Hexanone	46	9.5	11	2.3	
124-48-1	Dibromochloromethane	ND	9.5	ND	1.1	
106-93-4	1,2-Dibromoethane	ND	9.5	ND	1.2	
127-18-4	Tetrachloroethene	ND	9.5	ND	1.4	
108-90-7	Chlorobenzene	ND	9.5	ND	2.1	
100-41-4	Ethylbenzene	ND	9.5	ND	2.2	
179601-23-1	*m,p*-Xylenes	18	9.5	4.1	2.2	
75-25-2	Bromoform	ND	9.5	ND	0.92	
100-42-5	Styrene	ND	9.5	ND	2.2	
95-47-6	o-Xylene	ND	9.5	ND	2.2	
79-34-5	1,1,2,2-Tetrachloroethane	ND	9.5	ND	1.4	
541-73-1	1,3-Dichlorobenzene	ND	9.5	ND	1.6	
106-46-7	1,4-Dichlorobenzene	ND	9.5	ND	1.6	
95-50-1	1,2-Dichlorobenzene	ND	9.5	ND	1.6	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

Verified By: RG Date: 5/3/07

COLUMBIA ANALYTICAL SERVICES, INC.

RESULTS OF ANALYSIS

Client: Haley & Aldrich, Inc.
Client Sample ID: [redacted]-SS-1
Client Project ID: Home Ave SVI Investigation/26708-089

CAS Project ID: P2701235
CAS Sample ID: P2701235-005

Test Code: EPA TO-15
Instrument ID: Tekmar AUTOCAN/HP5972/HP5890 II+/MS2
Analyst: Chaney Humphrey
Sampling Media: Summa Canister
Test Notes:
Container ID: SC00772

Date Collected: 4/26/07
Date Received: 5/1/07
Date(s) Analyzed: 5/2 - 5/3/07
Volume(s) Analyzed: 1.00 Liter(s)
0.050 Liter(s)

Pi 1 = 0.0 Pf 1 = 3.5

Can D.F. = 1.24

CAS #	Compound	Result µg/m³	MRL µg/m³	Result ppbV	MRL ppbV	Data Qualifier
74-87-3	Chloromethane	ND	1.2	ND	0.60	
75-01-4	Vinyl Chloride	ND	1.2	ND	0.49	
74-83-9	Bromomethane	ND	1.2	ND	0.32	
75-00-3	Chloroethane	ND	1.2	ND	0.47	
67-64-1	Acetone	320	6.2	140	2.6	
75-69-4	Trichlorofluoromethane	1.5	1.2	0.26	0.22	
75-35-4	1,1-Dichloroethene	26	1.2	6.6	0.31	
75-09-2	Methylene chloride	ND	1.2	ND	0.36	
76-13-1	Trichlorotrifluoroethane	ND	1.2	ND	0.16	
75-15-0	Carbon Disulfide	ND	1.2	ND	0.40	
156-60-5	trans-1,2-Dichloroethene	ND	1.2	ND	0.31	
75-34-3	1,1-Dichloroethane	16	1.2	4.0	0.31	
1634-04-4	Methyl tert-Butyl Ether	3.8	1.2	1.1	0.34	
108-05-4	Vinyl Acetate	5.3	1.2	1.5	0.35	M
78-93-3	2-Butanone (MEK)	130	1.2	45	0.42	
156-59-2	cis-1,2-Dichloroethene	4.9	1.2	1.2	0.31	
67-66-3	Chloroform	270	1.2	56	0.25	
107-06-2	1,2-Dichloroethane	ND	1.2	ND	0.31	
71-55-6	1,1,1-Trichloroethane	350	1.2	64	0.23	
71-43-2	Benzene	2.6	1.2	0.82	0.39	
56-23-5	Carbon Tetrachloride	ND	1.2	ND	0.20	
78-87-5	1,2-Dichloropropane	ND	1.2	ND	0.27	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.
M = Matrix interference; results may be biased high.

Verified By: RL Date: 5/3/07

COLUMBIA ANALYTICAL SERVICES, INC.

RESULTS OF ANALYSIS

Client: Haley & Aldrich, Inc.
Client Sample ID: Ex. 6 P... Names, Ad...-1
Client Project ID: Home Ave SVI Investigation/26708-089

CAS Project ID: P2701235
CAS Sample ID: P2701235-005

Test Code: EPA TO-15
Instrument ID: Tekmar AUTOCAN/HP5972/HP5890 II+/MS2
Analyst: Chaney Humphrey
Sampling Media: Summa Canister
Test Notes:
Container ID: SC00772

Date Collected: 4/26/07
Date Received: 5/1/07
Date(s) Analyzed: 5/2 - 5/3/07
Volume(s) Analyzed: 1.00 Liter(s)
0.050 Liter(s)

Pi 1 = 0.0 Pf 1 = 3.5

Can D.F. = 1.24

CAS #	Compound	Result µg/m³	MRL µg/m³	Result ppbV	MRL ppbV	Data Qualifier
75-27-4	Bromodichloromethane	**3.2**	1.2	**0.47**	0.19	
79-01-6	Trichloroethene	**280**	1.2	**52**	0.23	
10061-01-5	cis-1,3-Dichloropropene	ND	1.2	ND	0.27	
108-10-1	4-Methyl-2-pentanone	**11**	1.2	**2.7**	0.30	
10061-02-6	trans-1,3-Dichloropropene	ND	1.2	ND	0.27	
79-00-5	1,1,2-Trichloroethane	ND	1.2	ND	0.23	
108-88-3	Toluene	**8.7**	1.2	**2.3**	0.33	
591-78-6	2-Hexanone	**3.6**	1.2	**0.87**	0.30	
124-48-1	Dibromochloromethane	ND	1.2	ND	0.15	
106-93-4	1,2-Dibromoethane	ND	1.2	ND	0.16	
127-18-4	Tetrachloroethene	**1,200**	1.2	**180**	0.18	
108-90-7	Chlorobenzene	ND	1.2	ND	0.27	
100-41-4	Ethylbenzene	**1.6**	1.2	**0.38**	0.29	
179601-23-1	*m,p*-Xylenes	**6.1**	1.2	**1.4**	0.29	
75-25-2	Bromoform	ND	1.2	ND	0.12	
100-42-5	Styrene	ND	1.2	ND	0.29	
95-47-6	o-Xylene	**2.0**	1.2	**0.45**	0.29	
79-34-5	1,1,2,2-Tetrachloroethane	ND	1.2	ND	0.18	
541-73-1	1,3-Dichlorobenzene	ND	1.2	ND	0.21	
106-46-7	1,4-Dichlorobenzene	ND	1.2	ND	0.21	
95-50-1	1,2-Dichlorobenzene	ND	1.2	ND	0.21	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

Verified By: RC Date: 5/3/07

COLUMBIA ANALYTICAL SERVICES, INC.

RESULTS OF ANALYSIS

Client: Haley & Aldrich, Inc.
Client Sample ID: [redacted]-InA-1
Client Project ID: Home Ave SVI Investigation/26708-089

CAS Project ID: P2701235
CAS Sample ID: P2701235-004

Test Code: EPA TO-15
Instrument ID: Tekmar AUTOCAN/HP5972/HP5890 II+/MS2
Analyst: Chaney Humphrey
Sampling Media: Summa Canister
Test Notes:
Container ID: AC00635

Date Collected: 4/26/07
Date Received: 5/1/07
Date(s) Analyzed: 5/2/07
Volume(s) Analyzed: 1.00 Liter(s)

Pi 1 = -2.5 Pf 1 = 3.5
Can D.F. = 1.49

CAS #	Compound	Result µg/m³	MRL µg/m³	Result ppbV	MRL ppbV	Data Qualifier
74-87-3	Chloromethane	ND	1.5	ND	0.72	
75-01-4	Vinyl Chloride	ND	1.5	ND	0.58	
74-83-9	Bromomethane	ND	1.5	ND	0.38	
75-00-3	Chloroethane	ND	1.5	ND	0.56	
67-64-1	Acetone	**22**	7.5	**9.1**	3.1	**M**
75-69-4	Trichlorofluoromethane	ND	1.5	ND	0.27	
75-35-4	1,1-Dichloroethene	ND	1.5	ND	0.38	
75-09-2	Methylene chloride	ND	1.5	ND	0.43	
76-13-1	Trichlorotrifluoroethane	ND	1.5	ND	0.19	
75-15-0	Carbon Disulfide	ND	1.5	ND	0.48	
156-60-5	trans-1,2-Dichloroethene	ND	1.5	ND	0.38	
75-34-3	1,1-Dichloroethane	ND	1.5	ND	0.37	
1634-04-4	Methyl tert-Butyl Ether	ND	1.5	ND	0.41	
108-05-4	Vinyl Acetate	**2.7**	1.5	**0.77**	0.42	
78-93-3	2-Butanone (MEK)	**2.0**	1.5	**0.68**	0.51	
156-59-2	cis-1,2-Dichloroethene	ND	1.5	ND	0.38	
67-66-3	Chloroform	**3.9**	1.5	**0.81**	0.31	
107-06-2	1,2-Dichloroethane	ND	1.5	ND	0.37	
71-55-6	1,1,1-Trichloroethane	ND	1.5	ND	0.27	
71-43-2	Benzene	ND	1.5	ND	0.47	
56-23-5	Carbon Tetrachloride	ND	1.5	ND	0.24	
78-87-5	1,2-Dichloropropane	ND	1.5	ND	0.32	

ND = Compound was analyzed for, but not detected above the **laboratory reporting limit.**
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.
M = Matrix interference; results may be biased high.

Verified By: RL Date: 5/3/07

COLUMBIA ANALYTICAL SERVICES, INC.

RESULTS OF ANALYSIS

Client: Haley & Aldrich, Inc.
Client Sample ID: [redacted]-InA-1
Client Project ID: Home Ave SVI Investigation/26708-089

CAS Project ID: P2701235
CAS Sample ID: P2701235-004

[redacted]

Test Code: EPA TO-15
Instrument ID: Tekmar AUTOCAN/HP5972/HP5890 II+/MS2
Analyst: Chaney Humphrey
Sampling Media: Summa Canister
Test Notes:
Container ID: AC00635

Date Collected: 4/26/07
Date Received: 5/1/07
Date(s) Analyzed: 5/2/07
Volume(s) Analyzed: 1.00 Liter(s)

Pi 1 = -2.5 Pf 1 = 3.5

Can D.F. = 1.49

CAS #	Compound	Result µg/m³	MRL µg/m³	Result ppbV	MRL ppbV	Data Qualifier
75-27-4	Bromodichloromethane	ND	1.5	ND	0.22	
79-01-6	Trichloroethene	**3.1**	1.5	**0.58**	0.28	
10061-01-5	cis-1,3-Dichloropropene	ND	1.5	ND	0.33	
108-10-1	4-Methyl-2-pentanone	ND	1.5	ND	0.36	
10061-02-6	trans-1,3-Dichloropropene	ND	1.5	ND	0.33	
79-00-5	1,1,2-Trichloroethane	ND	1.5	ND	0.27	
108-88-3	Toluene	**3.2**	1.5	**0.85**	0.40	
591-78-6	2-Hexanone	ND	1.5	ND	0.36	
124-48-1	Dibromochloromethane	ND	1.5	ND	0.17	
106-93-4	1,2-Dibromoethane	ND	1.5	ND	0.19	
127-18-4	Tetrachloroethene	**1.6**	1.5	**0.23**	0.22	
108-90-7	Chlorobenzene	ND	1.5	ND	0.32	
100-41-4	Ethylbenzene	ND	1.5	ND	0.34	
179601-23-1	*m,p*-Xylenes	ND	1.5	ND	0.34	
75-25-2	Bromoform	ND	1.5	ND	0.14	
100-42-5	Styrene	ND	1.5	ND	0.35	
95-47-6	o-Xylene	ND	1.5	ND	0.34	
79-34-5	1,1,2,2-Tetrachloroethane	ND	1.5	ND	0.22	
541-73-1	1,3-Dichlorobenzene	ND	1.5	ND	0.25	
106-46-7	1,4-Dichlorobenzene	ND	1.5	ND	0.25	
95-50-1	1,2-Dichlorobenzene	ND	1.5	ND	0.25	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

Verified By: RL Date: 5/3/07

COLUMBIA ANALYTICAL SERVICES, INC.

RESULTS OF ANALYSIS

Client: Haley & Aldrich, Inc.
Client Sample ID: Ex. 6 P... Names... 6 - ...-1
Client Project ID: Home Ave SVI Investigation/26708-089

CAS Project ID: P2701235
CAS Sample ID: P2701235-006

Test Code: EPA TO-15
Instrument ID: Tekmar AUTOCAN/HP5972/HP5890 II+/MS2
Analyst: Chaney Humphrey
Sampling Media: Summa Canister
Test Notes:
Container ID: AC00740

Date Collected: 4/26/07
Date Received: 5/1/07
Date(s) Analyzed: 5/2/07
Volume(s) Analyzed: 1.00 Liter(s)

Pi 1 = -5.0 Pf 1 = 3.5
Can D.F. = 1.88

CAS #	Compound	Result µg/m³	MRL µg/m³	Result ppbV	MRL ppbV	Data Qualifier
74-87-3	Chloromethane	ND	1.9	ND	0.91	
75-01-4	Vinyl Chloride	ND	1.9	ND	0.74	
74-83-9	Bromomethane	ND	1.9	ND	0.48	
75-00-3	Chloroethane	ND	1.9	ND	0.71	
67-64-1	Acetone	15	9.4	6.4	4.0	M
75-69-4	Trichlorofluoromethane	ND	1.9	ND	0.33	
75-35-4	1,1-Dichloroethene	ND	1.9	ND	0.47	
75-09-2	Methylene chloride	ND	1.9	ND	0.54	
76-13-1	Trichlorotrifluoroethane	ND	1.9	ND	0.25	
75-15-0	Carbon Disulfide	ND	1.9	ND	0.60	
156-60-5	trans-1,2-Dichloroethene	ND	1.9	ND	0.47	
75-34-3	1,1-Dichloroethane	ND	1.9	ND	0.46	
1634-04-4	Methyl tert-Butyl Ether	ND	1.9	ND	0.52	
108-05-4	Vinyl Acetate	ND	1.9	ND	0.53	
78-93-3	2-Butanone (MEK)	2.3	1.9	0.77	0.64	
156-59-2	cis-1,2-Dichloroethene	ND	1.9	ND	0.47	
67-66-3	Chloroform	ND	1.9	ND	0.39	
107-06-2	1,2-Dichloroethane	ND	1.9	ND	0.46	
71-55-6	1,1,1-Trichloroethane	ND	1.9	ND	0.34	
71-43-2	Benzene	ND	1.9	ND	0.59	
56-23-5	Carbon Tetrachloride	ND	1.9	ND	0.30	
78-87-5	1,2-Dichloropropane	ND	1.9	ND	0.41	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.
M = Matrix interference; results may be biased high.

Verified By: RG Date: 5/8/07

COLUMBIA ANALYTICAL SERVICES, INC.

RESULTS OF ANALYSIS

Client: Haley & Aldrich, Inc.
Client Sample ID: [redacted]-InA-1
Client Project ID: Home Ave SVI Investigation/26708-089

CAS Project ID: P2701235
CAS Sample ID: P2701235-006

Test Code: EPA TO-15
Instrument ID: Tekmar AUTOCAN/HP5972/HP5890 II+/MS2
Analyst: Chaney Humphrey
Sampling Media: Summa Canister
Test Notes:
Container ID: AC00740

Date Collected: 4/26/07
Date Received: 5/1/07
Date(s) Analyzed: 5/2/07
Volume(s) Analyzed: 1.00 Liter(s)

Pi 1 = -5.0 Pf 1 = 3.5

Can D.F. = 1.88

CAS #	Compound	Result µg/m³	MRL µg/m³	Result ppbV	MRL ppbV	Data Qualifier
75-27-4	Bromodichloromethane	ND	1.9	ND	0.28	
79-01-6	Trichloroethene	ND	1.9	ND	0.35	
10061-01-5	cis-1,3-Dichloropropene	ND	1.9	ND	0.41	
108-10-1	4-Methyl-2-pentanone	ND	1.9	ND	0.46	
10061-02-6	trans-1,3-Dichloropropene	ND	1.9	ND	0.41	
79-00-5	1,1,2-Trichloroethane	ND	1.9	ND	0.34	
108-88-3	Toluene	ND	1.9	ND	0.50	
591-78-6	2-Hexanone	ND	1.9	ND	0.46	
124-48-1	Dibromochloromethane	ND	1.9	ND	0.22	
106-93-4	1,2-Dibromoethane	ND	1.9	ND	0.24	
127-18-4	Tetrachloroethene	**4.5**	1.9	**0.66**	0.28	
108-90-7	Chlorobenzene	ND	1.9	ND	0.41	
100-41-4	Ethylbenzene	ND	1.9	ND	0.43	
179601-23-1	*m,p* -Xylenes	ND	1.9	ND	0.43	
75-25-2	Bromoform	ND	1.9	ND	0.18	
100-42-5	Styrene	ND	1.9	ND	0.44	
95-47-6	o-Xylene	ND	1.9	ND	0.43	
79-34-5	1,1,2,2-Tetrachloroethane	ND	1.9	ND	0.27	
541-73-1	1,3-Dichlorobenzene	ND	1.9	ND	0.31	
106-46-7	1,4-Dichlorobenzene	ND	1.9	ND	0.31	
95-50-1	1,2-Dichlorobenzene	ND	1.9	ND	0.31	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

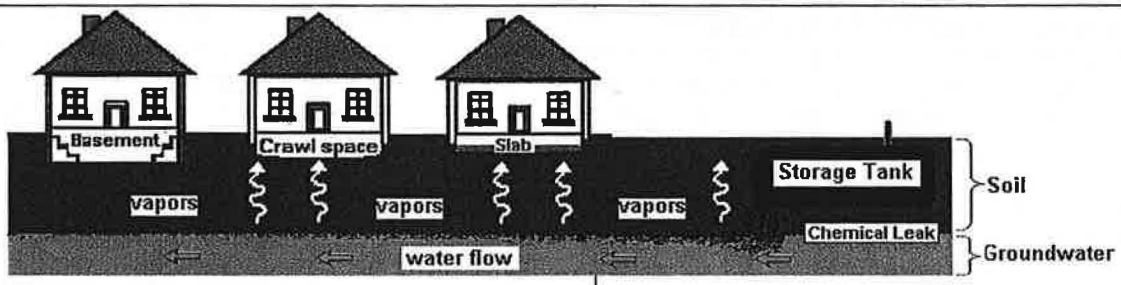
Verified By: RC Date: 5/3/07

Bureau of Environmental Health
Health Assessment Section

"To protect and improve the health of all Ohioans"

Vapor Intrusion

Answers to Frequently Asked Health Questions



What is vapor intrusion?

Vapor intrusion refers to the vapors produced by a chemical spill/leak that make their way into indoor air. When chemicals are spilled on the ground or leak from an underground storage tank, they will seep into the soils and will sometimes make their way into the groundwater (underground drinking water). There are a group of chemicals called volatile organic compounds (VOCs) that easily produce vapors. These vapors can travel through soils, especially if the soils are sandy and loose or have a lot of cracks (fissures). These vapors can then enter a home through cracks in the foundation or into a basement with a dirt floor or concrete slab.

VOCs and vapors:

VOCs can be found in petroleum products such as gasoline or diesel fuels, in solvents used for industrial cleaning and are also used in dry cleaning. If there is a large spill or leak resulting in soil or groundwater contamination, vapor intrusion may be possible and should be considered a potential public health concern that may require further investigation.

Although large spills or leaks are a public health concern, other sources of VOCs are found in everyday household products and are a more common source of poor indoor air quality. Common products such as paint, paint strippers and thinners, hobby supplies (glues), solvents, stored fuels (gasoline or home heating fuel), aerosol sprays, new carpeting or furniture, cigarette smoke, moth balls, air fresheners and dry-cleaned clothing all contain VOCs.

Can you get sick from vapor intrusion?

You can get sick from breathing harmful chemical vapors. But getting sick will depend on:
How much you were exposed to (dose).
How long you were exposed (duration).
How often you were exposed (frequency).
How toxic the spill/leak chemicals are.
General Health, age, lifestyle: Young children, the elderly and people with chronic (on-going) health problems are more at risk to chemical exposures.

VOC vapors at high levels can cause a strong petroleum or solvent odor and some persons may experience eye and respiratory irritation, headache and/or nausea (upset stomach). These symptoms are usually temporary and go away when the person is moved to fresh air.

Lower levels of vapors may go unnoticed and a person may feel no health effects. A few individual VOCs are known carcinogens (cause cancer). Health officials are concerned with low-level chemical exposures that happen over many years and may raise a person's lifetime risk for developing cancer.

How is vapor intrusion investigated?

In most cases, collecting soil gas or groundwater samples near the spill site is done first to see if there is on-site contamination. If soil vapors or groundwater contamination are detected at a spill site, environmental protection and public health officials may then ask that soil vapor samples be taken from areas outside the immediate spill site and near any potential affected business or home. The Ohio Department of Health (ODH) does not usually recommend indoor air sampling for vapor intrusion before the on-site contamination is determined.

(continued on next page)

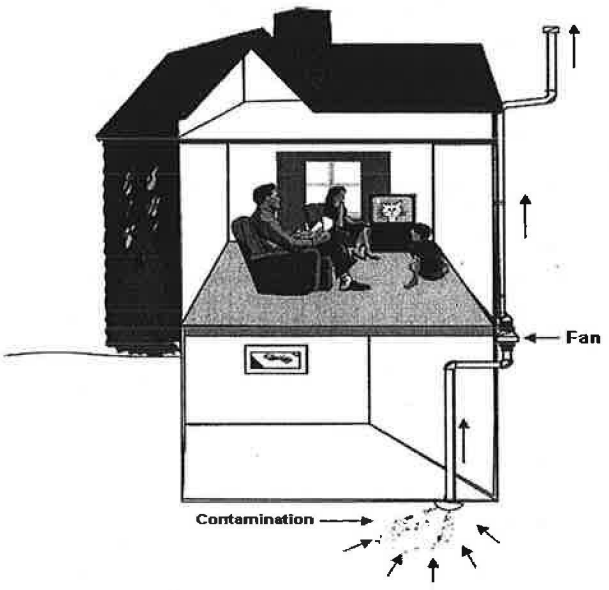
How is vapor intrusion investigated? (continued)

Because a variety of VOC sources are present in most homes, testing will not necessarily confirm VOCs in the indoor air are from VOC contamination in soils at nearby spill site. But if additional sampling is recommended, samples may be taken from beneath the home's foundation (called sub-slab samples), to see if vapors have reached the home. Sub-slab samples are more reliable than indoor air samples and are not as affected by other indoor chemical sources. If there was a need for additional sampling on a private property, homeowners would be contacted by the cleanup contractor or others working on the cleanup site and their cooperation and consent would be requested before any testing/sampling would be done.

What happens if a vapor intrusion problem is found?

If vapor intrusion is having an effect on the air in your home, the most common solution is to install a *radon mitigation system*. A radon mitigation system will prevent gases in the soil from entering the home. A low amount of suction is applied below the foundation and the vapors are vented to the outside. The system uses minimal electricity and should not noticeably affect heating and cooling efficiency. This mitigation system also prevents radon from entering the home, an added health benefit. Usually, the party responsible for cleaning up the contamination is also responsible for paying for the installation of this system. Once the contamination is cleaned up, the system should no longer be needed. In homes with on going radon problems, ODH suggests these systems remain in place permanently.

Radon Mitigation System



What can you do to improve your indoor air quality?

As stated before, the most likely source of VOCs in indoor air comes from the common items that are found in most homes. The following helpful hints will help improve air quality inside your home:

- Do not buy more chemicals than you need and know what products contain VOCs.
- If you have a garage or an out building such as a shed, place the properly stored VOC-containing chemicals outside and away from your family living areas.
- Immediately clean and ventilate any VOC spill area.
- If you smoke, go outside and/or open the windows to ventilate the second-hand, VOC-containing smoke outdoors.
- Make sure all your major appliances and fireplace(s) are in good condition and not leaking harmful VOC vapors. Fix all appliance and fireplace leaks promptly, as well as other leaks that cause moisture problems that encourage mold growth.
- Most VOCs are a fire hazard. Make sure these chemicals are stored in appropriate containers and in a well-ventilated location and away from an open pilot light (flame) of a gas water heater or furnace.
- Fresh air will help prevent both build up of chemical vapors in the air and mold growth. Occasionally open the windows and doors and ventilate.
- Test your home for radon and install a radon detector.

References:

Wisconsin Department of Health and Family Services, Environmental Health Resources, Vapor Intrusion, electronic, 2004.

New York State Department of Health, Center for Environmental Health, April 2003.

Ohio Department of Health, Bureau of Environmental Health, Indoor Environment Program, 2004.

For more information contact:

Ohio Department of Health
Bureau of Environmental Health
Health Assessment Section
246 N. High Street
Columbus, Ohio 43215
Phone: (614) 466-1390
Fax: (614) 466-4556

Created September 2004

Bureau of Environmental Health
Health Assessment Section
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Chloroform

Answers to Frequently Asked Health Questions

What is chloroform?

Chloroform, also called trichloromethane or methyltrichloride, is a colorless liquid with a pleasant, non-irritating odor and a slightly sweet taste. As a volatile organic compound (VOC), chloroform easily vaporizes (turns into a gas) in the air. Chloroform does not easily burn, but it will burn when it reaches very high temperatures. Chloroform was one of the first inhaled anesthetics to be used during surgery, but it is not used as an anesthesia today.

Where do you find chloroform?

In order to destroy the harmful bacteria found in our drinking water and waste waters, the chemical chlorine is added to these water sources. As a by-product of adding chlorine to our drinking and waste waters, small amounts of chloroform are formed. So small amounts of chloroform are likely to be found almost everywhere.

In industry, nearly all the chloroform made in the U.S. is used to make other chemicals. From the factories that make or use this chemical, chloroform can enter the air directly or it can enter the air from the evaporation (changing from liquid to a gas) of chloroform-contaminated waters and soils. Chloroform can also enter the water and soils from industry storage and waste sites spills and leaks.

Not only does chloroform evaporate very quickly when exposed to air, it also dissolves easily in water and does not stick to the soils very well. This means chloroform can easily travel through the soils to groundwater, where it can enter a water supply. Chloroform lasts a long time in both the air and in groundwater. Most of the chloroform in the air eventually breaks down, but it is a slow process. Chloroform does not appear to build up in great amounts in plants and animals, but we may find some small amounts of chloroform in foods.

How do you come in contact with chloroform? Who is more at risk?

You are most likely to be exposed to chloroform by drinking contaminated water and/or by breathing contaminated indoor or outdoor air. Chloroform is found in nearly all public drinking water supplies. Chloroform is also found in the air from all areas of the United States. You are probably exposed to small amounts of chloroform in your drinking water and/or in beverages that are made using water that contains chloroform.

People who are at greater risk to be exposed to chloroform at higher-than-normal levels are people who work at or near chemical plants and factories that make or use chloroform. Higher exposures might occur in workers at drinking water treatment plants, waste water treatment plants, and paper and pulp mills. People who operate waste-burning equipment may also be exposed to higher than normal levels. People who swim a lot in swimming pools may also be exposed to higher levels.

How does chloroform enter and leave your body?

- Chloroform can enter your body if you breathe contaminated air (inhalation)
- Chloroform can enter your body if you eat/drink contaminated food or water (ingestion)
- Chloroform can also enter your body through the skin (dermal).

If you take a bath, shower or swim in a pool with chloroform-contaminated water, it can enter your body through inhalation and dermal contact.

Studies in humans and animals show that after you breathe contaminated air or eat contaminated food, the chloroform can quickly enter your bloodstream from your lungs and intestines. Inside your body, chloroform is carried by the blood to all parts of your body, such as the liver, kidneys and fat cells.

Some of the chloroform that enters your body leaves unchanged in the air you breathe out and some of it is broken down into other chemicals. These chemicals are known as breakdown products or metabolites, and some of them can attach to other chemicals inside the cells of your body and may cause harmful effects if they collect in high enough amounts in your body. Some of the metabolites will leave the body in the air you breathe out and small amounts of the breakdown products leave the body in the urine and stool.

How does chloroform affect health?

In humans, large amounts of chloroform can affect the central nervous system (brain), liver and kidneys. Breathing high levels for a short time can cause fatigue, dizziness, and headache. If you breathe air, eat food, or drink water containing elevated levels of chloroform, over a long period, the chloroform may damage your liver and kidneys. Large amounts of chloroform can cause sores (lesions) when the chloroform touches your skin.

Lab studies have shown chloroform caused reproductive problems in animals (mice and rats). However, there is no evidence that show whether chloroform causes harmful reproductive effects or birth defects in humans.

Does chloroform cause cancer?

Based on animal studies, the Department of Health and Human Services (DHHS) has determined that chloroform may reasonably be anticipated to be a carcinogen (a substance that causes cancer). The International Agency for Research on Cancer (IARC) has determined that chloroform is possibly carcinogenic to humans (2B). The EPA has also determined that chloroform is a "probable" human carcinogen.

Results of studies of people who drank chlorinated water showed a possible link between the chloroform in the chlorinated water and the occurrence of cancer of the colon and urinary bladder. Rats and mice that ate food or drank water that had large amounts of chloroform in it for a long period of time developed cancer of the liver and kidneys. However, there is no evidence that shows whether chloroform causes liver and kidney cancer in humans.

Is there a medical test to show whether you have been exposed to chloroform?

Although we can measure the amount of chloroform in the air you breathe out and in blood, urine, and body tissues, we have no reliable test to determine how much chloroform you have been exposed to or whether you will experience any harmful health effects.

The measurement of chloroform in body fluids and tissues may help to determine if you have come into contact with large amounts of chloroform. However, these tests are useful only a short time after you are exposed to chloroform because it leaves the body quickly.

What has been done to protect human health?

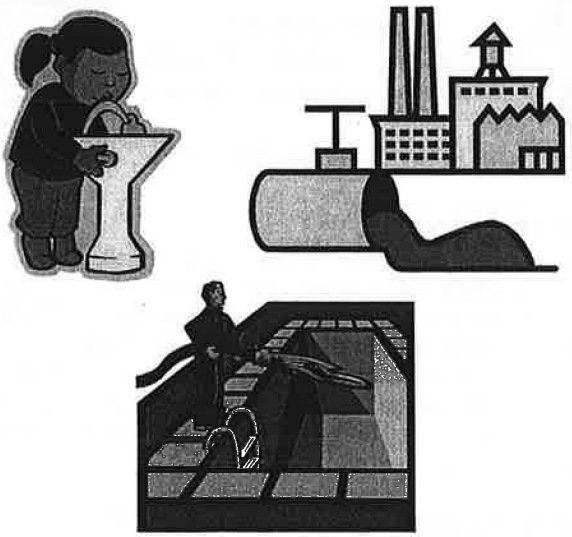
The amount of chloroform normally expected to be in the air ranges from 0.02 to 0.05 parts of chloroform per billion parts (ppb) of air and from 2 to 44 ppb in treated drinking water.

Notes: The below unit of measurement will be found in the ppb (parts per billion) range. Examples: One part per billion (1 ppb) would be equal to having one bean in a pile of one billion beans, or one ppb would be equal to one second of time in 32 years.

The Environmental Protection Agency (EPA) has set the level of chloroform in drinking water at 80 ppb.

The Occupational Safety and Health Administration (OSHA) has set a permissible 50,000 ppb exposure limit of air in the workplace during an 8-hour workday, 40-hour week.

The EPA requires chloroform spills or accidental releases into the environment of 10 pounds or more of be reported to the EPA.



For more information contact:

Ohio Department of Health
Bureau of Environmental Health
Health Assessment Section
246 N. High Street
Columbus, Ohio 43215
Phone: (614) 466-1390
Fax: (614) 466-4556

Reference:

Agency for Toxic Substances and Disease Registry (ATSDR). 1997. Toxicological profile for chloroform. Atlanta, GA: U.S. Department of Health and Human Services, Public Health Service.

The Ohio Department of Health is in cooperative agreement with the Agency for Toxic Substances and Disease Registry (ATSDR), Public Health Service, U.S. Department of Health and Human Services.

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ATSDR
AGENCY FOR TOXIC SUBSTANCES AND DISEASE REGISTRY

Created 04/10/07

Bureau of
Environmental Health
Health Assessment Section
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Trichloroethylene (TCE)

(try- klor'oh eth'uh- leen)

Answers to Frequently Asked Health Questions

What is TCE?

TCE is man-made chemical that is not found naturally in the environment. TCE is a non-flammable (does not burn), colorless liquid with a somewhat sweet odor and has a sweet, "burning" taste. It is mainly used as a cleaner to remove grease from metal parts. TCE can also be found in glues, paint removers, typewriter correction fluids and spot removers.

The biggest source of TCE in the environment comes from evaporation (changing from a liquid into a vapor/gas) when industries use TCE to remove grease from metals. But TCE also enters the air when we use common household products that contain TCE. It can also enter the soil and water as the result of spills or improper disposal.

What happens to TCE in the environment?

- TCE will quickly evaporate from the surface waters of rivers, lakes, streams, creeks and puddles.
- If TCE is spilled on the ground, some of it will evaporate and some of it may leak down into the ground. When it rains, TCE can sink through the soils and into the ground (underground drinking) water.
- When TCE is in an oxygen-poor environment and with time, it will break down into different chemicals such as 1,2 Dichloroethene and Vinyl Chloride.
- TCE does not build up in plants and animals.
- The TCE found in foods is believed to come from TCE contaminated water used in food processing or from food processing equipment cleaned with TCE.

How does TCE get into your body?

- TCE can get into your body by breathing (inhalation) air that is polluted with TCE vapors. The vapors can be produced from the manufacturing of TCE, from TCE polluted water evaporating in the shower or by using household products such as spot removers and typewriter correction fluid.
- TCE can get into your body by drinking (ingestion) TCE polluted water.
- Small amounts of TCE can get into your body through skin (dermal) contact. This can take place when using TCE as a cleaner to remove grease from metal parts or by contact with TCE polluted soils.

Can TCE make you sick?

Yes, you can get sick from TCE. But getting sick will depend on the following:

- How much you were exposed to (dose).
- How long you were exposed (duration).
- How often you were exposed (frequency).
- General Health, Age, Lifestyle Young children, the elderly and people with chronic (on-going) health problems are more at risk to chemical exposures.

How does TCE affect your health?

Breathing (Inhalation):

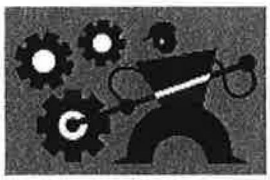
- Breathing high levels of TCE may cause headaches, lung irritation, dizziness, poor coordination (clumsy) and difficulty concentrating.
- Breathing very high levels of TCE for long periods may cause nerve, kidney and liver damage.

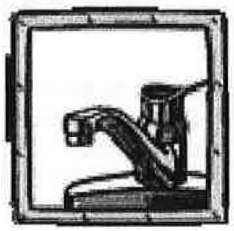
Drinking (Ingestion):

- Drinking high concentrations of TCE in the water for long periods may cause liver and kidney damage, harm immune system functions and damage fetal development in pregnant women (although the extent of some of these effects is not yet clear).
- It is uncertain whether drinking low levels of TCE will lead to adverse health effects.

Skin (Dermal) Contact:

- Short periods of skin contact with high levels of TCE may cause skin rashes.





Does TCE cause cancer?

The National Toxicology Program's 11th Report on Carcinogens places chemicals into one of two cancer-causing categories: *Known to be Human Carcinogens* and *Reasonably Anticipated to be Human Carcinogens.*

The11th Report on Carcinogens states TCE is *"Reasonably Anticipated to be Human Carcinogen."*

The category *"Reasonably Anticipated to be Human Carcinogen"* gathers evidence mainly from animal studies. There may be limited human studies or there may be no human or animal study evidence to support carcinogenicity; but the agent, substance or mixture belongs to a well-defined class of substances that are known to be carcinogenic.

There are human studies of communities that were exposed to high levels of TCE in drinking water and they have found evidence of increased leukemia's. But the residents of these communities were also exposed to other solvents and may have had other risk factors associated with this type of cancer.

Animal lab studies in mice and rats have suggested that high levels of TCE may cause liver, lung, kidney and blood (lymphoma) cancers.

As part of the National Exposure Subregistry, the Agency for Toxic Substances and Disease Registry (ATSDR) compiled data on 4,280 residents of three states (Michigan, Illinois, and Indiana) who had environmental exposure to TCE. ATSDR found no definitive evidence for an excess of cancers from these TCE exposures.

The U.S. EPA is currently reviewing the carcinogenicity of TCE.

Is there a medical test to show whether you have been exposed to TCE?

If you have recently been exposed to TCE, it can be detected in your breath, blood, or urine. The breath test, if done soon after exposure, can tell if you have been exposed to even a small amount of TCE.

Exposure to larger amounts is measured in blood and urine tests. These tests detect TCE and many of its breakdown products for up to a week after exposure. However, exposure to other similar chemicals can produce the same breakdown products in the blood and urine so the detection of the breakdown products is not absolute proof of exposure to TCE.

These tests aren't available at most doctors' offices, but can be done at special laboratories that have the right equipment. **Note:** Tests can determine if you have been exposed to TCE but cannot predict if you will experience adverse health effects from the exposure.

Has the federal government made recommendations to protect human health?

The federal government develops regulations and recommendations to protect public health and these regulations can be enforced by law.

Recommendations and regulations are periodically updated as more information becomes available. Some regulations and recommendations for TCE follow:

- The Environmental Protection Agency (EPA) has set a maximum contaminant level for TCE in drinking water at 0.005 milligrams per liter (0.005 mg/L) or 5 parts of TCE per billion parts water (5 ppb).
- The Occupational Safety and Health Administration (OSHA) have set an exposure limit of 100 ppm (or 100 parts of TCE per million parts of air) for an 8-hour workday, 40-hour workweek.
- The EPA has developed regulations for the handling and disposal of TCE.

References

Agency for Toxic Substances and Disease Registry (ATSDR). 1997. Toxicological profile for TCE (electronic at **http://www.atsdr.cdc.gov/tfacts19.html**)

Report on Carcinogens, Eleventh Edition; U.S. Department of Health and Human Services, Public Health Service, National Toxicology Program, 2005 (2005 electronic at **http://ntp.niehs.nih.gov/ntp/roc/toc11.html**)

The Ohio Department of Health is in cooperative agreement with the Agency for Toxic Substances and Disease Registry (ATSDR), Public Health Service, U.S. Department of Health and Human Services.

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ATSDR
AGENCY FOR TOXIC SUBSTANCES AND DISEASE REGISTRY

Updated 10/12/06

Bureau of Environmental Health
Health Assessment Section

"To protect and improve the health of all Ohioans"

Tetrachloroethylene (PCE)

Other names for tetrachloroethylene include PCE, perchloroethylene, PERC or tetrachloroethene.

What is PCE?

Tetrachloroethylene (also known as PCE, PERC or perchloroethylene) is a man-made chemical that is widely used for dry cleaning clothes and degreasing metal. It is also used to make other chemicals and can be found in some household products such as water repellents, silicone lubricants, spot removers, adhesives and wood cleaners. It easily evaporates (turn from a liquid to a gas) into the air and has a sharp, sweet odor. PCE is a nonflammable (does not burn) liquid at room temperature.

How does PCE get into the environment?

PCE can evaporate into the air during dry cleaning operations and during industrial use. It can also evaporate into the air if it is not properly stored or was spilled. If it was spilled or leaked on the ground, it may find its way into groundwater (underground drinking water).

People can be exposed to PCE from the environment from household products, from dry cleaning products and from their occupation (work). Common environmental levels of PCE (called background levels) can be found in the air we breathe, in the water we drink and in the food we eat. In general, levels in the air are higher in the cities or around industrial areas where it is used more than rural or remote areas.

The people with the greatest chance of exposure to PCE are those who work with it. According to estimates from a survey conducted by the National Institute for Occupational Safety and Health (NIOSH), more than 650,000 U.S. workers may be exposed. However, the air close to dry cleaning business and industrial sites may have levels of PCE higher than background levels. If the dry cleaning business or industry has spilled or leaked PCE on the ground, there may also be contaminated groundwater as well.

What happens to PCE in the environment?

Much of the PCE that gets into surface waters or soil evaporates into the air. However, some of the PCE may make its way to the groundwater. Microorganisms can break down some of the PCE in soil or underground water. In the air, it is broken down by sunlight into other chemicals or brought back to the soil and water by rain. PCE does not appear to collect in fish or other animals that live in water.

How can PCE enter and leave my body?

PCE can enter your body when you breathe contaminated air or when you drink water or eat food contaminated with the chemical. If PCE is trapped against your skin, a small amount of it can pass through into your body. Very little PCE in the air can pass through your skin into your body. Breathing contaminated air and drinking water are the two most likely ways people will be exposed to PCE. How much enters your body depends on how much of the chemical is in the air, how fast and deeply you are breathing, how long you are exposed to it or how much of the chemical you eat or drink.

Most PCE leaves your body from your lungs when you breathe out. This is true whether you take in the chemical by breathing, drinking, eating, or touching it. A small amount is changed by your body (in your liver) into other chemicals that are removed from your body in urine. Most of the changed PCE leaves your body in a few days. Some of it that you take in is found in your blood and other tissues, especially body fat. Part of the PCE that is stored in fat may stay in your body for several days or weeks before it is eliminated.

Can PCE make you sick?

Yes, you can get sick from contact with PCE. But getting sick will depend upon:

- How much you were exposed to (dose).
- How long you were exposed (duration).
- How often you were exposed (frequency).
- General Health, Age, Lifestyle Young children, the elderly and people with chronic (on-going) health problems are more at risk to chemical exposures.

How can PCE affect my health?

Exposure to very high concentrations of PCE (particularly in closed, poorly ventilated areas) can cause dizziness, headache, sleepiness, confusion, nausea, difficulty in speaking and walking, unconsciousness and even death. Skin irritation may result from repeated or extended contact with it as well. These symptoms occur almost entirely in work (or hobby) environments when people have been accidentally exposed to high concentrations or have intentionally used PCE to get a "high." Normal background levels (or common environmental levels) will not cause these health affects.

Does PCE cause cancer (carcinogen)?

In the United States, the National Toxicology Program (NTP) releases the *Report on Carcinogens* (RoC) every two years. The *Report on Carcinogens* (RoC) identifies two groups of agents: "Known to be human carcinogens" & "Reasonably anticipated to be human carcinogens."

PCE has been shown to cause liver tumors in mice and kidney tumors in male rats. There is limited evidence for the carcinogenicity of PCE in humans. PCE has been studied by observing laundry and dry-cleaning workers, who may also have been exposed to other solvents, especially trichloroethylene (TCE), but also petroleum solvents.

The *Eleventh Report on Carcinogens* (RoC) has determined that PCE may reasonably be anticipated to be a carcinogen.

Reference:

Agency for Toxic Substances and Disease Registry (ATSDR). 1997. Toxicological Profile for tetrachloroethylene. Atlanta, GA: U.S. Department of Health and Human Services, Public Health Service

Report on Carcinogens, Eleventh Edition; U.S. Department of Health and Human Services, Public Health Service, National Toxicology Program, 2006. http://ntp.niehs.nih.gov/ntp/roc/toc11.html

Is there a medical test to show whether you have been exposed to PCE?

One way of testing for PCE exposure is to measure the amount of the chemical in the breath, much the same way breath-alcohol measurements are used to determine the amount of alcohol in the blood. Because PCE is stored in the body's fat and slowly released into the bloodstream, it can be detected in the breath for weeks following a heavy exposure. Also, PCE and trichloroacetic acid (TCA), a breakdown product of PCE, can be detected in the blood. These tests are relatively simple to perform but are not available at most doctors' offices and must be done at special laboratories that have the right equipment. Because exposure to other chemicals can produce the same breakdown products in the urine and blood, the tests for breakdown products cannot determine if you have been exposed to PCE or the other chemicals that produce the same breakdown chemicals.

What has the federal government made recommendations to protect human health?

The EPA maximum contaminant level for the amount of PCE that can be in drinking water is 0.005 milligrams PCE per liter of water (0.005 mg/L).

The Occupational Safety and Health Administration (OSHA) have set a limit of 100 ppm for an 8-hour workday over a 40-hour workweek.

The National Institute for Occupational Safety and Health (NIOSH) recommends that PCE be handled as a potential carcinogen and recommends that levels in workplace air should be as low as possible.

The Ohio Department of Health is in cooperative agreement with the Agency for Toxic Substances and Disease Registry (ATSDR), Public Health Service, U.S. Department of Health and Human Services.

This pamphlet was created by the Ohio Department of Health, Bureau of Environmental Health, Health Assessment Section and supported in whole by funds from the Cooperative Agreement Program grant from the ATSDR.

ATSDR
AGENCY FOR TOXIC SUBSTANCES AND DISEASE REGISTRY

Revised 08-21-06

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
CINCINNATI, OHIO 45268

October 1, 2007

Mr. [redacted] (Tenant)
[redacted]
Dayton, Ohio 45417

Dear Mr. [redacted]

The purpose of this letter is to inform you of the results of the sub-slab (the space under your basement floor) and indoor air samples collected from your building on April 26, 2007. As you know, these samples were collected to see if soil vapors from the Delphi plant were moving through the soils and entering the air inside your building. They were specifically tested for the presence of chloroform, trichloroethylene (also known as TCE) and tetrachloroethylene (also known as perchloroethylene or PCE), which have been detected under the neighborhood.

These chemicals are volatile organic compounds, which means they easily evaporate (turn from a liquid to a gas) when they are exposed to the soil or air. These chemicals have the potential, as vapors, to move through the soils and work their way into building substructures, such as basements, where they can accumulate in the indoor air.

The results for the samples collected at your building are presented below and are identified as "Detected." Both sub-slab and indoor air samples are measured in units called parts per billion (ppb). Following the result for each sample is the "screening level" for that chemical. The Ohio Department of Health (ODH) has recommended the screening levels for sub-slab and indoor air.

[redacted] **Sub-Slab Sampling Results:**
Detected: Chloroform at 200 ppb, ODH recommended screening level: 22 ppb
Detected: TCE at 110 ppb, ODH recommended screening level: 4 ppb
Detected: PCE at 180 ppb, ODH recommended screening level: 120 ppb

[redacted] **Indoor Air Sampling Results:**
Detected: Chloroform at 0.81 ppb, ODH recommended screening level: 2.2 ppb
Detected: TCE at 0.58 ppb, ODH recommended screening level: 0.4 ppb
Detected: PCE at 0.66 ppb, ODH recommended screening level: 12 ppb

The results from the **sub-slab sample** collected at your building show the chemicals chloroform, TCE, PCE were **found at levels higher** than the screening levels recommended by the ODH. The **indoor air sample** results show the chemical TCE was **found at a level higher** than the screening level recommended by the ODH.

Based on the laboratory results of the sub-slab and indoor air samples collected from your building, the U.S. EPA and ODH recommend that a vapor mitigation system be installed in your building to lower the levels of these chemicals in the indoor air. In

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
CINCINNATI, OHIO 45268

addition to installation of the system, the U.S. EPA and ODH recommend routine sampling at your building to ensure the mitigation system is working properly.

Delphi and the U.S. EPA are working together to address site contamination and to protect the community. We will be contacting you in the near future about installation of the mitigation system at your building.

If you have health-related questions concerning this matter, please contact Bob Frey at the Ohio Department of Health at 614-466-1069. If you have questions related to the sampling or the on-going site investigation, please feel free to contact me at 513-569-7539. You may contact Delphi directly at Delphi's toll-free information number at 1-866-4- DELPHI (1-866-433-5744).

Sincerely,

Steven L. Renninger
On-Scene Coordinator
U.S. EPA Region 5

Attachments: Analytical Results
ODH Fact Sheets (4)

cc: Site File

COLUMBIA ANALYTICAL SERVICES, INC.

RESULTS OF ANALYSIS

Client: Haley & Aldrich, Inc.
Client Sample ID: Ex. 6 P... Name...-SS-1
Client Project ID: Home Ave SVI Investigation/26708-089

CAS Project ID: P2701235
CAS Sample ID: P2701235-003

Test Code: EPA TO-15
Instrument ID: Tekmar AUTOCAN/HP5972/HP5890 II+/MS2
Analyst: Chaney Humphrey
Sampling Media: Summa Canister
Test Notes:
Container ID: SC00078

Date Collected: 4/26/07
Date Received: 5/1/07
Date(s) Analyzed: 5/2/07
Volume(s) Analyzed: 0.15 Liter(s)

Pi 1 = -1.9 Pf 1 = 3.5

Can D.F. = 1.42

CAS #	Compound	Result µg/m³	MRL µg/m³	Result ppbV	MRL ppbV	Data Qualifier
74-87-3	Chloromethane	ND	9.5	ND	4.6	
75-01-4	Vinyl Chloride	ND	9.5	ND	3.7	
74-83-9	Bromomethane	ND	9.5	ND	2.4	
75-00-3	Chloroethane	ND	9.5	ND	3.6	
67-64-1	Acetone	**560**	47	**240**	20	**M**
75-69-4	Trichlorofluoromethane	ND	9.5	ND	1.7	
75-35-4	1,1-Dichloroethene	ND	9.5	ND	2.4	
75-09-2	Methylene chloride	ND	9.5	ND	2.7	
76-13-1	Trichlorotrifluoroethane	ND	9.5	ND	1.2	
75-15-0	Carbon Disulfide	ND	9.5	ND	3.0	
156-60-5	trans-1,2-Dichloroethene	ND	9.5	ND	2.4	
75-34-3	1,1-Dichloroethane	ND	9.5	ND	2.3	
1634-04-4	Methyl tert-Butyl Ether	ND	9.5	ND	2.6	
108-05-4	Vinyl Acetate	**20**	9.5	**5.7**	2.7	**M**
78-93-3	2-Butanone (MEK)	**320**	9.5	**110**	3.2	
156-59-2	cis-1,2-Dichloroethene	ND	9.5	ND	2.4	
67-66-3	Chloroform	**960**	9.5	**200**	1.9	
107-06-2	1,2-Dichloroethane	ND	9.5	ND	2.3	
71-55-6	1,1,1-Trichloroethane	**35**	9.5	**6.4**	1.7	
71-43-2	Benzene	**25**	9.5	**7.9**	3.0	
56-23-5	Carbon Tetrachloride	ND	9.5	ND	1.5	
78-87-5	1,2-Dichloropropane	ND	9.5	ND	2.0	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.
M = Matrix interference; results may be biased high.

Verified By: RG Date: 5/3/07

COLUMBIA ANALYTICAL SERVICES, INC.

RESULTS OF ANALYSIS

Client: Haley & Aldrich, Inc.
Client Sample ID: Ex. 6 P... Names...-SS-1
Client Project ID: Home Ave SVI Investigation/26708-089

CAS Project ID: P2701235
CAS Sample ID: P2701235-003

Test Code: EPA TO-15
Instrument ID: Tekmar AUTOCAN/HP5972/HP5890 II+/MS2
Analyst: Chaney Humphrey
Sampling Media: Summa Canister
Test Notes:
Container ID: SC00078

Date Collected: 4/26/07
Date Received: 5/1/07
Date(s) Analyzed: 5/2/07
Volume(s) Analyzed: 0.15 Liter(s)

Pi l = -1.9 Pf l = 3.5

Can D.F. = 1.42

CAS #	Compound	Result µg/m³	MRL µg/m³	Result ppbV	MRL ppbV	Data Qualifier
75-27-4	Bromodichloromethane	ND	9.5	ND	1.4	
79-01-6	Trichloroethene	610	9.5	110	1.8	
10061-01-5	cis-1,3-Dichloropropene	ND	9.5	ND	2.1	
108-10-1	4-Methyl-2-pentanone	24	9.5	6.0	2.3	
10061-02-6	trans-1,3-Dichloropropene	ND	9.5	ND	2.1	
79-00-5	1,1,2-Trichloroethane	ND	9.5	ND	1.7	
108-88-3	Toluene	45	9.5	12	2.5	
591-78-6	2-Hexanone	46	9.5	11	2.3	
124-48-1	Dibromochloromethane	ND	9.5	ND	1.1	
106-93-4	1,2-Dibromoethane	ND	9.5	ND	1.2	
127-18-4	Tetrachloroethene	ND	9.5	ND	1.4	
108-90-7	Chlorobenzene	ND	9.5	ND	2.1	
100-41-4	Ethylbenzene	ND	9.5	ND	2.2	
179601-23-1	*m,p*-Xylenes	18	9.5	4.1	2.2	
75-25-2	Bromoform	ND	9.5	ND	0.92	
100-42-5	Styrene	ND	9.5	ND	2.2	
95-47-6	o-Xylene	ND	9.5	ND	2.2	
79-34-5	1,1,2,2-Tetrachloroethane	ND	9.5	ND	1.4	
541-73-1	1,3-Dichlorobenzene	ND	9.5	ND	1.6	
106-46-7	1,4-Dichlorobenzene	ND	9.5	ND	1.6	
95-50-1	1,2-Dichlorobenzene	ND	9.5	ND	1.6	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

Verified By: RG Date: 5/3/07 RG

COLUMBIA ANALYTICAL SERVICES, INC.

RESULTS OF ANALYSIS

Client: Haley & Aldrich, Inc.
Client Sample ID: [redacted]SS-1
Client Project ID: Home Ave SVI Investigation/26708-089

CAS Project ID: P2701235
CAS Sample ID: P2701235-005

Test Code: EPA TO-15
Instrument ID: Tekmar AUTOCAN/HP5972/HP5890 II+/MS2
Analyst: Chaney Humphrey
Sampling Media: Summa Canister
Test Notes:
Container ID: SC00772

Date Collected: 4/26/07
Date Received: 5/1/07
Date(s) Analyzed: 5/2 - 5/3/07
Volume(s) Analyzed: 1.00 Liter(s)
0.050 Liter(s)

Pi 1 = 0.0 Pf 1 = 3.5

Can D.F. = 1.24

CAS #	Compound	Result µg/m³	MRL µg/m³	Result ppbV	MRL ppbV	Data Qualifier
74-87-3	Chloromethane	ND	1.2	ND	0.60	
75-01-4	Vinyl Chloride	ND	1.2	ND	0.49	
74-83-9	Bromomethane	ND	1.2	ND	0.32	
75-00-3	Chloroethane	ND	1.2	ND	0.47	
67-64-1	Acetone	320	6.2	140	2.6	
75-69-4	Trichlorofluoromethane	1.5	1.2	0.26	0.22	
75-35-4	1,1-Dichloroethene	26	1.2	6.6	0.31	
75-09-2	Methylene chloride	ND	1.2	ND	0.36	
76-13-1	Trichlorotrifluoroethane	ND	1.2	ND	0.16	
75-15-0	Carbon Disulfide	ND	1.2	ND	0.40	
156-60-5	trans-1,2-Dichloroethene	ND	1.2	ND	0.31	
75-34-3	1,1-Dichloroethane	16	1.2	4.0	0.31	
1634-04-4	Methyl tert-Butyl Ether	3.8	1.2	1.1	0.34	
108-05-4	Vinyl Acetate	5.3	1.2	1.5	0.35	M
78-93-3	2-Butanone (MEK)	130	1.2	45	0.42	
156-59-2	cis-1,2-Dichloroethene	4.9	1.2	1.2	0.31	
67-66-3	Chloroform	270	1.2	56	0.25	
107-06-2	1,2-Dichloroethane	ND	1.2	ND	0.31	
71-55-6	1,1,1-Trichloroethane	350	1.2	64	0.23	
71-43-2	Benzene	2.6	1.2	0.82	0.39	
56-23-5	Carbon Tetrachloride	ND	1.2	ND	0.20	
78-87-5	1,2-Dichloropropane	ND	1.2	ND	0.27	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.
M = Matrix interference; results may be biased high.

Verified By: RLS Date: 5/3/07

COLUMBIA ANALYTICAL SERVICES, INC.

RESULTS OF ANALYSIS

Client: Haley & Aldrich, Inc.
Client Sample ID: [redacted]-SS-1
Client Project ID: Home Ave SVI Investigation/26708-089

CAS Project ID: P2701235
CAS Sample ID: P2701235-005

Test Code: EPA TO-15
Instrument ID: Tekmar AUTOCAN/HP5972/HP5890 II+/MS2
Analyst: Chaney Humphrey
Sampling Media: Summa Canister
Test Notes:
Container ID: SC00772

Date Collected: 4/26/07
Date Received: 5/1/07
Date(s) Analyzed: 5/2 - 5/3/07
Volume(s) Analyzed: 1.00 Liter(s)
0.050 Liter(s)

Pi 1 = 0.0 Pf 1 = 3.5

Can D.F. = 1.24

CAS #	Compound	Result µg/m³	MRL µg/m³	Result ppbV	MRL ppbV	Data Qualifier
75-27-4	Bromodichloromethane	**3.2**	1.2	**0.47**	0.19	
79-01-6	Trichloroethene	**280**	1.2	**52**	0.23	
10061-01-5	cis-1,3-Dichloropropene	ND	1.2	ND	0.27	
108-10-1	4-Methyl-2-pentanone	**11**	1.2	**2.7**	0.30	
10061-02-6	trans-1,3-Dichloropropene	ND	1.2	ND	0.27	
79-00-5	1,1,2-Trichloroethane	ND	1.2	ND	0.23	
108-88-3	Toluene	**8.7**	1.2	**2.3**	0.33	
591-78-6	2-Hexanone	**3.6**	1.2	**0.87**	0.30	
124-48-1	Dibromochloromethane	ND	1.2	ND	0.15	
106-93-4	1,2-Dibromoethane	ND	1.2	ND	0.16	
127-18-4	Tetrachloroethene	**1,200**	1.2	**180**	0.18	
108-90-7	Chlorobenzene	ND	1.2	ND	0.27	
100-41-4	Ethylbenzene	**1.6**	1.2	**0.38**	0.29	
179601-23-1	*m,p*-Xylenes	**6.1**	1.2	**1.4**	0.29	
75-25-2	Bromoform	ND	1.2	ND	0.12	
100-42-5	Styrene	ND	1.2	ND	0.29	
95-47-6	o-Xylene	**2.0**	1.2	**0.45**	0.29	
79-34-5	1,1,2,2-Tetrachloroethane	ND	1.2	ND	0.18	
541-73-1	1,3-Dichlorobenzene	ND	1.2	ND	0.21	
106-46-7	1,4-Dichlorobenzene	ND	1.2	ND	0.21	
95-50-1	1,2-Dichlorobenzene	ND	1.2	ND	0.21	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

Verified By: RG Date: 5/3/07

COLUMBIA ANALYTICAL SERVICES, INC.

RESULTS OF ANALYSIS

Client: Haley & Aldrich, Inc.
Client Sample ID: [redacted]-InA-1
Client Project ID: Home Ave SVI Investigation/26708-089

CAS Project ID: P2701235
CAS Sample ID: P2701235-004

Test Code: EPA TO-15
Instrument ID: Tekmar AUTOCAN/HP5972/HP5890 II+/MS2
Analyst: Chaney Humphrey
Sampling Media: Summa Canister
Test Notes:
Container ID: AC00635

Date Collected: 4/26/07
Date Received: 5/1/07
Date(s) Analyzed: 5/2/07
Volume(s) Analyzed: 1.00 Liter(s)

Pi 1 = -2.5 Pf 1 = 3.5

Can D.F. = 1.49

CAS #	Compound	Result µg/m³	MRL µg/m³	Result ppbV	MRL ppbV	Data Qualifier
74-87-3	Chloromethane	ND	1.5	ND	0.72	
75-01-4	Vinyl Chloride	ND	1.5	ND	0.58	
74-83-9	Bromomethane	ND	1.5	ND	0.38	
75-00-3	Chloroethane	ND	1.5	ND	0.56	
67-64-1	Acetone	**22**	7.5	**9.1**	3.1	**M**
75-69-4	Trichlorofluoromethane	ND	1.5	ND	0.27	
75-35-4	1,1-Dichloroethene	ND	1.5	ND	0.38	
75-09-2	Methylene chloride	ND	1.5	ND	0.43	
76-13-1	Trichlorotrifluoroethane	ND	1.5	ND	0.19	
75-15-0	Carbon Disulfide	ND	1.5	ND	0.48	
156-60-5	trans-1,2-Dichloroethene	ND	1.5	ND	0.38	
75-34-3	1,1-Dichloroethane	ND	1.5	ND	0.37	
1634-04-4	Methyl tert-Butyl Ether	ND	1.5	ND	0.41	
108-05-4	Vinyl Acetate	**2.7**	1.5	**0.77**	0.42	
78-93-3	2-Butanone (MEK)	**2.0**	1.5	**0.68**	0.51	
156-59-2	cis-1,2-Dichloroethene	ND	1.5	ND	0.38	
67-66-3	Chloroform	**3.9**	1.5	**0.81**	0.31	
107-06-2	1,2-Dichloroethane	ND	1.5	ND	0.37	
71-55-6	1,1,1-Trichloroethane	ND	1.5	ND	0.27	
71-43-2	Benzene	ND	1.5	ND	0.47	
56-23-5	Carbon Tetrachloride	ND	1.5	ND	0.24	
78-87-5	1,2-Dichloropropane	ND	1.5	ND	0.32	

ND = Compound was analyzed for, but not detected above the **laboratory reporting limit.**
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.
M = Matrix interference; results may be biased high.

Verified By: RL Date: 5/3/07

COLUMBIA ANALYTICAL SERVICES, INC.

RESULTS OF ANALYSIS

Client: Haley & Aldrich, Inc.
Client Sample ID: Ex. 6 P... Names...-InA-1
Client Project ID: Home Ave SVI Investigation/26708-089

CAS Project ID: P2701235
CAS Sample ID: P2701235-004

Test Code: EPA TO-15
Instrument ID: Tekmar AUTOCAN/HP5972/HP5890 II+/MS2
Analyst: Chaney Humphrey
Sampling Media: Summa Canister
Test Notes:
Container ID: AC00635

Date Collected: 4/26/07
Date Received: 5/1/07
Date(s) Analyzed: 5/2/07
Volume(s) Analyzed: 1.00 Liter(s)

Pi 1 = -2.5 Pf 1 = 3.5

Can D.F. = 1.49

CAS #	Compound	Result µg/m³	MRL µg/m³	Result ppbV	MRL ppbV	Data Qualifier
75-27-4	Bromodichloromethane	ND	1.5	ND	0.22	
79-01-6	Trichloroethene	**3.1**	1.5	**0.58**	0.28	
10061-01-5	cis-1,3-Dichloropropene	ND	1.5	ND	0.33	
108-10-1	4-Methyl-2-pentanone	ND	1.5	ND	0.36	
10061-02-6	trans-1,3-Dichloropropene	ND	1.5	ND	0.33	
79-00-5	1,1,2-Trichloroethane	ND	1.5	ND	0.27	
108-88-3	Toluene	**3.2**	1.5	**0.85**	0.40	
591-78-6	2-Hexanone	ND	1.5	ND	0.36	
124-48-1	Dibromochloromethane	ND	1.5	ND	0.17	
106-93-4	1,2-Dibromoethane	ND	1.5	ND	0.19	
127-18-4	Tetrachloroethene	**1.6**	1.5	**0.23**	0.22	
108-90-7	Chlorobenzene	ND	1.5	ND	0.32	
100-41-4	Ethylbenzene	ND	1.5	ND	0.34	
179601-23-1	*m,p* -Xylenes	ND	1.5	ND	0.34	
75-25-2	Bromoform	ND	1.5	ND	0.14	
100-42-5	Styrene	ND	1.5	ND	0.35	
95-47-6	o-Xylene	ND	1.5	ND	0.34	
79-34-5	1,1,2,2-Tetrachloroethane	ND	1.5	ND	0.22	
541-73-1	1,3-Dichlorobenzene	ND	1.5	ND	0.25	
106-46-7	1,4-Dichlorobenzene	ND	1.5	ND	0.25	
95-50-1	1,2-Dichlorobenzene	ND	1.5	ND	0.25	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

Verified By: RL Date: 5/3/07

COLUMBIA ANALYTICAL SERVICES, INC.

RESULTS OF ANALYSIS

Client: Haley & Aldrich, Inc.
Client Sample ID: [redacted]-InA-1
Client Project ID: Home Ave SVI Investigation/26708-089

CAS Project ID: P2701235
CAS Sample ID: P2701235-006

Test Code: EPA TO-15
Instrument ID: Tekmar AUTOCAN/HP5972/HP5890 II+/MS2
Analyst: Chaney Humphrey
Sampling Media: Summa Canister
Test Notes:
Container ID: AC00740

Date Collected: 4/26/07
Date Received: 5/1/07
Date(s) Analyzed: 5/2/07
Volume(s) Analyzed: 1.00 Liter(s)

Pi 1 = -5.0 Pf 1 = 3.5

Can D.F. = 1.88

CAS #	Compound	Result µg/m³	MRL µg/m³	Result ppbV	MRL ppbV	Data Qualifier
74-87-3	Chloromethane	ND	1.9	ND	0.91	
75-01-4	Vinyl Chloride	ND	1.9	ND	0.74	
74-83-9	Bromomethane	ND	1.9	ND	0.48	
75-00-3	Chloroethane	ND	1.9	ND	0.71	
67-64-1	Acetone	15	9.4	6.4	4.0	M
75-69-4	Trichlorofluoromethane	ND	1.9	ND	0.33	
75-35-4	1,1-Dichloroethene	ND	1.9	ND	0.47	
75-09-2	Methylene chloride	ND	1.9	ND	0.54	
76-13-1	Trichlorotrifluoroethane	ND	1.9	ND	0.25	
75-15-0	Carbon Disulfide	ND	1.9	ND	0.60	
156-60-5	trans-1,2-Dichloroethene	ND	1.9	ND	0.47	
75-34-3	1,1-Dichloroethane	ND	1.9	ND	0.46	
1634-04-4	Methyl tert-Butyl Ether	ND	1.9	ND	0.52	
108-05-4	Vinyl Acetate	ND	1.9	ND	0.53	
78-93-3	2-Butanone (MEK)	2.3	1.9	0.77	0.64	
156-59-2	cis-1,2-Dichloroethene	ND	1.9	ND	0.47	
67-66-3	Chloroform	ND	1.9	ND	0.39	
107-06-2	1,2-Dichloroethane	ND	1.9	ND	0.46	
71-55-6	1,1,1-Trichloroethane	ND	1.9	ND	0.34	
71-43-2	Benzene	ND	1.9	ND	0.59	
56-23-5	Carbon Tetrachloride	ND	1.9	ND	0.30	
78-87-5	1,2-Dichloropropane	ND	1.9	ND	0.41	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.
M = Matrix interference; results may be biased high.

Verified By: RG Date: 5/8/07

COLUMBIA ANALYTICAL SERVICES, INC.

RESULTS OF ANALYSIS

Client: Haley & Aldrich, Inc.
Client Sample ID: Ex. 6 P... Name...-InA-1
Client Project ID: Home Ave SVI Investigation/26708-089

CAS Project ID: P2701235
CAS Sample ID: P2701235-006

Test Code: EPA TO-15
Instrument ID: Tekmar AUTOCAN/HP5972/HP5890 II+/MS2
Analyst: Chaney Humphrey
Sampling Media: Summa Canister
Test Notes:
Container ID: AC00740

Date Collected: 4/26/07
Date Received: 5/1/07
Date(s) Analyzed: 5/2/07
Volume(s) Analyzed: 1.00 Liter(s)

Pi l = -5.0 Pf l = 3.5

Can D.F. = 1.88

CAS #	Compound	Result µg/m³	MRL µg/m³	Result ppbV	MRL ppbV	Data Qualifier
75-27-4	Bromodichloromethane	ND	1.9	ND	0.28	
79-01-6	Trichloroethene	ND	1.9	ND	0.35	
10061-01-5	cis-1,3-Dichloropropene	ND	1.9	ND	0.41	
108-10-1	4-Methyl-2-pentanone	ND	1.9	ND	0.46	
10061-02-6	trans-1,3-Dichloropropene	ND	1.9	ND	0.41	
79-00-5	1,1,2-Trichloroethane	ND	1.9	ND	0.34	
108-88-3	Toluene	ND	1.9	ND	0.50	
591-78-6	2-Hexanone	ND	1.9	ND	0.46	
124-48-1	Dibromochloromethane	ND	1.9	ND	0.22	
106-93-4	1,2-Dibromoethane	ND	1.9	ND	0.24	
127-18-4	Tetrachloroethene	4.5	1.9	0.66	0.28	
108-90-7	Chlorobenzene	ND	1.9	ND	0.41	
100-41-4	Ethylbenzene	ND	1.9	ND	0.43	
179601-23-1	*m,p*-Xylenes	ND	1.9	ND	0.43	
75-25-2	Bromoform	ND	1.9	ND	0.18	
100-42-5	Styrene	ND	1.9	ND	0.44	
95-47-6	o-Xylene	ND	1.9	ND	0.43	
79-34-5	1,1,2,2-Tetrachloroethane	ND	1.9	ND	0.27	
541-73-1	1,3-Dichlorobenzene	ND	1.9	ND	0.31	
106-46-7	1,4-Dichlorobenzene	ND	1.9	ND	0.31	
95-50-1	1,2-Dichlorobenzene	ND	1.9	ND	0.31	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

Verified By: RC Date: 5/3/07

Bureau of Environmental Health
Health Assessment Section
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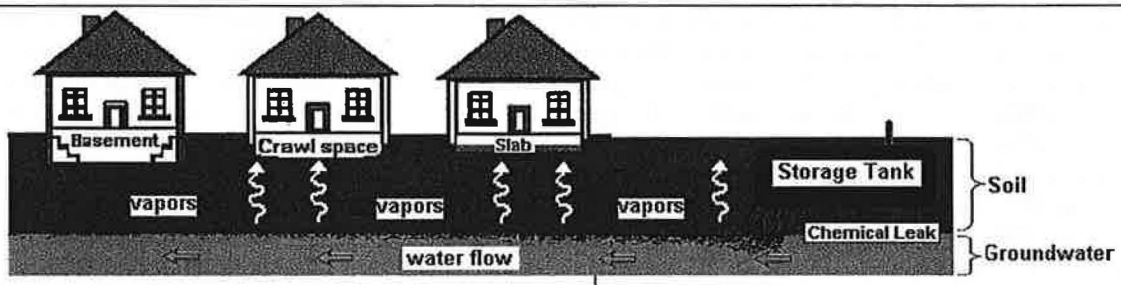
Vapor Intrusion

Answers to Frequently Asked Health Questions



What is vapor intrusion?

Vapor intrusion refers to the vapors produced by a chemical spill/leak that make their way into indoor air. When chemicals are spilled on the ground or leak from an underground storage tank, they will seep into the soils and will sometimes make their way into the groundwater (underground drinking water). There are a group of chemicals called volatile organic compounds (VOCs) that easily produce vapors. These vapors can travel through soils, especially if the soils are sandy and loose or have a lot of cracks (fissures). These vapors can then enter a home through cracks in the foundation or into a basement with a dirt floor or concrete slab.

VOCs and vapors:

VOCs can be found in petroleum products such as gasoline or diesel fuels, in solvents used for industrial cleaning and are also used in dry cleaning. If there is a large spill or leak resulting in soil or groundwater contamination, vapor intrusion may be possible and should be considered a potential public health concern that may require further investigation.

Although large spills or leaks are a public health concern, other sources of VOCs are found in everyday household products and are a more common source of poor indoor air quality. Common products such as paint, paint strippers and thinners, hobby supplies (glues), solvents, stored fuels (gasoline or home heating fuel), aerosol sprays, new carpeting or furniture, cigarette smoke, moth balls, air fresheners and dry-cleaned clothing all contain VOCs.

Can you get sick from vapor intrusion?

You can get sick from breathing harmful chemical vapors. But getting sick will depend on:
How much you were exposed to (dose).
How long you were exposed (duration).
How often you were exposed (frequency).
How toxic the spill/leak chemicals are.
General Health, age, lifestyle: Young children, the elderly and people with chronic (on-going) health problems are more at risk to chemical exposures.

VOC vapors at high levels can cause a strong petroleum or solvent odor and some persons may experience eye and respiratory irritation, headache and/or nausea (upset stomach). These symptoms are usually temporary and go away when the person is moved to fresh air.

Lower levels of vapors may go unnoticed and a person may feel no health effects. A few individual VOCs are known carcinogens (cause cancer). Health officials are concerned with low-level chemical exposures that happen over many years and may raise a person's lifetime risk for developing cancer.

How is vapor intrusion investigated?

In most cases, collecting soil gas or groundwater samples near the spill site is done first to see if there is on-site contamination. If soil vapors or groundwater contamination are detected at a spill site, environmental protection and public health officials may then ask that soil vapor samples be taken from areas outside the immediate spill site and near any potential affected business or home. The Ohio Department of Health (ODH) does not usually recommend indoor air sampling for vapor intrusion before the on-site contamination is determined.

(continued on next page)

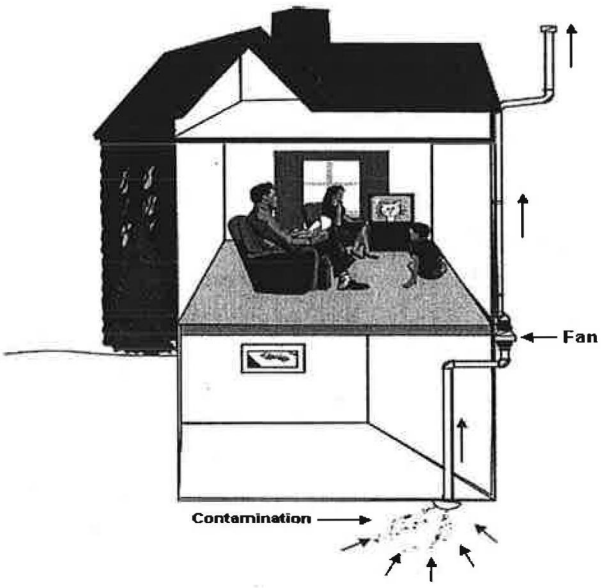
How is vapor intrusion investigated? (continued)

Because a variety of VOC sources are present in most homes, testing will not necessarily confirm VOCs in the indoor air are from VOC contamination in soils at nearby spill site. But if additional sampling is recommended, samples may be taken from beneath the home's foundation (called sub-slab samples), to see if vapors have reached the home. Sub-slab samples are more reliable than indoor air samples and are not as affected by other indoor chemical sources. If there was a need for additional sampling on a private property, homeowners would be contacted by the cleanup contractor or others working on the cleanup site and their cooperation and consent would be requested before any testing/sampling would be done.

What happens if a vapor intrusion problem is found?

If vapor intrusion is having an effect on the air in your home, the most common solution is to install a *radon mitigation system*. A radon mitigation system will prevent gases in the soil from entering the home. A low amount of suction is applied below the foundation and the vapors are vented to the outside. The system uses minimal electricity and should not noticeably affect heating and cooling efficiency. This mitigation system also prevents radon from entering the home, an added health benefit. Usually, the party responsible for cleaning up the contamination is also responsible for paying for the installation of this system. Once the contamination is cleaned up, the system should no longer be needed. In homes with on going radon problems, ODH suggests these systems remain in place permanently.

Radon Mitigation System



What can you do to improve your indoor air quality?

As stated before, the most likely source of VOCs in indoor air comes from the common items that are found in most homes. The following helpful hints will help improve air quality inside your home:

- Do not buy more chemicals than you need and know what products contain VOCs.
- If you have a garage or an out building such as a shed, place the properly stored VOC-containing chemicals outside and away from your family living areas.
- Immediately clean and ventilate any VOC spill area.
- If you smoke, go outside and/or open the windows to ventilate the second-hand, VOC-containing smoke outdoors.
- Make sure all your major appliances and fireplace(s) are in good condition and not leaking harmful VOC vapors. Fix all appliance and fireplace leaks promptly, as well as other leaks that cause moisture problems that encourage mold growth.
- Most VOCs are a fire hazard. Make sure these chemicals are stored in appropriate containers and in a well-ventilated location and away from an open pilot light (flame) of a gas water heater or furnace.
- Fresh air will help prevent both build up of chemical vapors in the air and mold growth. Occasionally open the windows and doors and ventilate.
- Test your home for radon and install a radon detector.

References:

Wisconsin Department of Health and Family Services, Environmental Health Resources, Vapor Intrusion, electronic, 2004.

New York State Department of Health, Center for Environmental Health, April 2003.

Ohio Department of Health, Bureau of Environmental Health, Indoor Environment Program, 2004.

For more information contact:

Ohio Department of Health
Bureau of Environmental Health
Health Assessment Section
246 N. High Street
Columbus, Ohio 43215
Phone: (614) 466-1390
Fax: (614) 466-4556

Created September 2004

Bureau of Environmental Health
Health Assessment Section
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Chloroform

Answers to Frequently Asked Health Questions

What is chloroform?

Chloroform, also called trichloromethane or methyltrichloride, is a colorless liquid with a pleasant, non-irritating odor and a slightly sweet taste. As a volatile organic compound (VOC), chloroform easily vaporizes (turns into a gas) in the air. Chloroform does not easily burn, but it will burn when it reaches very high temperatures. Chloroform was one of the first inhaled anesthetics to be used during surgery, but it is not used as an anesthesia today.

Where do you find chloroform?

In order to destroy the harmful bacteria found in our drinking water and waste waters, the chemical chlorine is added to these water sources. As a by-product of adding chlorine to our drinking and waste waters, small amounts of chloroform are formed. So small amounts of chloroform are likely to be found almost everywhere.

In industry, nearly all the chloroform made in the U.S. is used to make other chemicals. From the factories that make or use this chemical, chloroform can enter the air directly or it can enter the air from the evaporation (changing from liquid to a gas) of chloroform-contaminated waters and soils. Chloroform can also enter the water and soils from industry storage and waste sites spills and leaks.

Not only does chloroform evaporate very quickly when exposed to air, it also dissolves easily in water and does not stick to the soils very well. This means chloroform can easily travel through the soils to groundwater, where it can enter a water supply. Chloroform lasts a long time in both the air and in groundwater. Most of the chloroform in the air eventually breaks down, but it is a slow process. Chloroform does not appear to build up in great amounts in plants and animals, but we may find some small amounts of chloroform in foods.

How do you come in contact with chloroform? Who is more at risk?

You are most likely to be exposed to chloroform by drinking contaminated water and/or by breathing contaminated indoor or outdoor air. Chloroform is found in nearly all public drinking water supplies. Chloroform is also found in the air from all areas of the United States. You are probably exposed to small amounts of chloroform in your drinking water and/or in beverages that are made using water that contains chloroform.

People who are at greater risk to be exposed to chloroform at higher-than-normal levels are people who work at or near chemical plants and factories that make or use chloroform. Higher exposures might occur in workers at drinking water treatment plants, waste water treatment plants, and paper and pulp mills. People who operate waste-burning equipment may also be exposed to higher than normal levels. People who swim a lot in swimming pools may also be exposed to higher levels.

How does chloroform enter and leave your body?

- Chloroform can enter your body if you breathe contaminated air (inhalation)
- Chloroform can enter your body if you eat/drink contaminated food or water (ingestion)
- Chloroform can also enter your body through the skin (dermal).

If you take a bath, shower or swim in a pool with chloroform-contaminated water, it can enter your body through inhalation and dermal contact.

Studies in humans and animals show that after you breathe contaminated air or eat contaminated food, the chloroform can quickly enter your bloodstream from your lungs and intestines. Inside your body, chloroform is carried by the blood to all parts of your body, such as the liver, kidneys and fat cells.

Some of the chloroform that enters your body leaves unchanged in the air you breathe out and some of it is broken down into other chemicals. These chemicals are known as breakdown products or metabolites, and some of them can attach to other chemicals inside the cells of your body and may cause harmful effects if they collect in high enough amounts in your body. Some of the metabolites will leave the body in the air you breathe out and small amounts of the breakdown products leave the body in the urine and stool.

How does chloroform affect health?

In humans, large amounts of chloroform can affect the central nervous system (brain), liver and kidneys. Breathing high levels for a short time can cause fatigue, dizziness, and headache. If you breathe air, eat food, or drink water containing elevated levels of chloroform, over a long period, the chloroform may damage your liver and kidneys. Large amounts of chloroform can cause sores (lesions) when the chloroform touches your skin.

Lab studies have shown chloroform caused reproductive problems in animals (mice and rats). However, there is no evidence that show whether chloroform causes harmful reproductive effects or birth defects in humans.

Does chloroform cause cancer?

Based on animal studies, the Department of Health and Human Services (DHHS) has determined that chloroform may reasonably be anticipated to be a carcinogen (a substance that causes cancer). The International Agency for Research on Cancer (IARC) has determined that chloroform is possibly carcinogenic to humans (2B). The EPA has also determined that chloroform is a "probable" human carcinogen.

Results of studies of people who drank chlorinated water showed a possible link between the chloroform in the chlorinated water and the occurrence of cancer of the colon and urinary bladder. Rats and mice that ate food or drank water that had large amounts of chloroform in it for a long period of time developed cancer of the liver and kidneys. However, there is no evidence that shows whether chloroform causes liver and kidney cancer in humans.

Is there a medical test to show whether you have been exposed to chloroform?

Although we can measure the amount of chloroform in the air you breathe out and in blood, urine, and body tissues, we have no reliable test to determine how much chloroform you have been exposed to or whether you will experience any harmful health effects.

The measurement of chloroform in body fluids and tissues may help to determine if you have come into contact with large amounts of chloroform. However, these tests are useful only a short time after you are exposed to chloroform because it leaves the body quickly.

What has been done to protect human health?

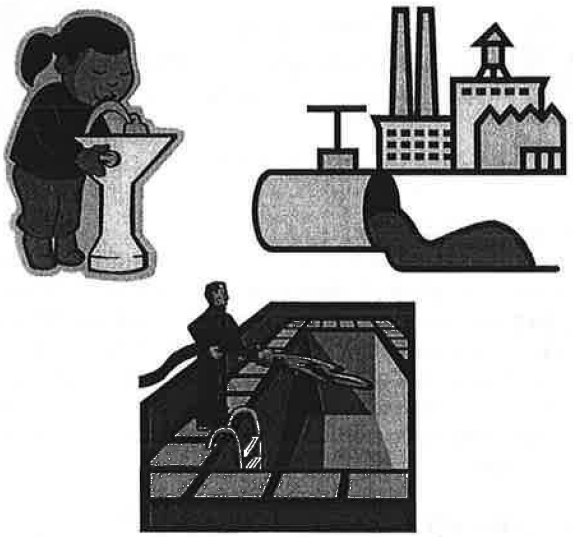
The amount of chloroform normally expected to be in the air ranges from 0.02 to 0.05 parts of chloroform per billion parts (ppb) of air and from 2 to 44 ppb in treated drinking water.

Notes: The below unit of measurement will be found in the ppb (parts per billion) range. Examples: One part per billion (1 ppb) would be equal to having one bean in a pile of one billion beans, or one ppb would be equal to one second of time in 32 years.

The Environmental Protection Agency (EPA) has set the level of chloroform in drinking water at 80 ppb.

The Occupational Safety and Health Administration (OSHA) has set a permissible 50,000 ppb exposure limit of air in the workplace during an 8-hour workday, 40-hour week.

The EPA requires chloroform spills or accidental releases into the environment of 10 pounds or more of be reported to the EPA.



For more information contact:

Ohio Department of Health
Bureau of Environmental Health
Health Assessment Section
246 N. High Street
Columbus, Ohio 43215
Phone: (614) 466-1390
Fax: (614) 466-4556

Reference:

Agency for Toxic Substances and Disease Registry (ATSDR). 1997. Toxicological profile for chloroform. Atlanta, GA: U.S. Department of Health and Human Services, Public Health Service.

The Ohio Department of Health is in cooperative agreement with the Agency for Toxic Substances and Disease Registry (ATSDR), Public Health Service, U.S. Department of Health and Human Services.

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ATSDR
AGENCY FOR TOXIC SUBSTANCES AND DISEASE REGISTRY

Created 04/10/07

Bureau of
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Trichloroethylene (TCE)

(try- klor'oh eth'uh- leen)

Answers to Frequently Asked Health Questions

What is TCE?

TCE is man-made chemical that is not found naturally in the environment. TCE is a non-flammable (does not burn), colorless liquid with a somewhat sweet odor and has a sweet, "burning" taste. It is mainly used as a cleaner to remove grease from metal parts. TCE can also be found in glues, paint removers, typewriter correction fluids and spot removers.

The biggest source of TCE in the environment comes from evaporation (changing from a liquid into a vapor/gas) when industries use TCE to remove grease from metals. But TCE also enters the air when we use common household products that contain TCE. It can also enter the soil and water as the result of spills or improper disposal.

What happens to TCE in the environment?

- TCE will quickly evaporate from the surface waters of rivers, lakes, streams, creeks and puddles.
- If TCE is spilled on the ground, some of it will evaporate and some of it may leak down into the ground. When it rains, TCE can sink through the soils and into the ground (underground drinking) water.
- When TCE is in an oxygen-poor environment and with time, it will break down into different chemicals such as 1,2 Dichloroethene and Vinyl Chloride.
- TCE does not build up in plants and animals.
- The TCE found in foods is believed to come from TCE contaminated water used in food processing or from food processing equipment cleaned with TCE.

How does TCE get into your body?

- TCE can get into your body by breathing (inhalation) air that is polluted with TCE vapors. The vapors can be produced from the manufacturing of TCE, from TCE polluted water evaporating in the shower or by using household products such as spot removers and typewriter correction fluid.
- TCE can get into your body by drinking (ingestion) TCE polluted water.
- Small amounts of TCE can get into your body through skin (dermal) contact. This can take place when using TCE as a cleaner to remove grease from metal parts or by contact with TCE polluted soils.

Can TCE make you sick?

Yes, you can get sick from TCE. But getting sick will depend on the following:

- How much you were exposed to (dose).
- How long you were exposed (duration).
- How often you were exposed (frequency).
- General Health, Age, Lifestyle Young children, the elderly and people with chronic (on-going) health problems are more at risk to chemical exposures.

How does TCE affect your health?

Breathing (Inhalation):

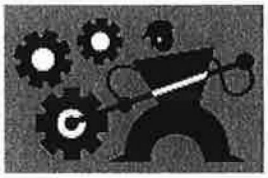
- Breathing high levels of TCE may cause headaches, lung irritation, dizziness, poor coordination (clumsy) and difficulty concentrating.
- Breathing very high levels of TCE for long periods may cause nerve, kidney and liver damage.

Drinking (Ingestion):

- Drinking high concentrations of TCE in the water for long periods may cause liver and kidney damage, harm immune system functions and damage fetal development in pregnant women (although the extent of some of these effects is not yet clear).
- It is uncertain whether drinking low levels of TCE will lead to adverse health effects.

Skin (Dermal) Contact:

- Short periods of skin contact with high levels of TCE may cause skin rashes.



Does TCE cause cancer?

The National Toxicology Program's 11th Report on Carcinogens places chemicals into one of two cancer-causing categories: *Known to be Human Carcinogens* and *Reasonably Anticipated to be Human Carcinogens*.

The11th Report on Carcinogens states TCE is *"Reasonably Anticipated to be Human Carcinogen."*

The category *"Reasonably Anticipated to be Human Carcinogen"* gathers evidence mainly from animal studies. There may be limited human studies or there may be no human or animal study evidence to support carcinogenicity; but the agent, substance or mixture belongs to a well-defined class of substances that are known to be carcinogenic.

There are human studies of communities that were exposed to high levels of TCE in drinking water and they have found evidence of increased leukemia's. But the residents of these communities were also exposed to other solvents and may have had other risk factors associated with this type of cancer.

Animal lab studies in mice and rats have suggested that high levels of TCE may cause liver, lung, kidney and blood (lymphoma) cancers.

As part of the National Exposure Subregistry, the Agency for Toxic Substances and Disease Registry (ATSDR) compiled data on 4,280 residents of three states (Michigan, Illinois, and Indiana) who had environmental exposure to TCE. ATSDR found no definitive evidence for an excess of cancers from these TCE exposures.

The U.S. EPA is currently reviewing the carcinogenicity of TCE.

Is there a medical test to show whether you have been exposed to TCE?

If you have recently been exposed to TCE, it can be detected in your breath, blood, or urine. The breath test, if done soon after exposure, can tell if you have been exposed to even a small amount of TCE.

Exposure to larger amounts is measured in blood and urine tests. These tests detect TCE and many of its breakdown products for up to a week after exposure. However, exposure to other similar chemicals can produce the same breakdown products in the blood and urine so the detection of the breakdown products is not absolute proof of exposure to TCE.

These tests aren't available at most doctors' offices, but can be done at special laboratories that have the right equipment. **Note:** Tests can determine if you have been exposed to TCE but cannot predict if you will experience adverse health effects from the exposure.

Has the federal government made recommendations to protect human health?

The federal government develops regulations and recommendations to protect public health and these regulations can be enforced by law.

Recommendations and regulations are periodically updated as more information becomes available. Some regulations and recommendations for TCE follow:

- The Environmental Protection Agency (EPA) has set a maximum contaminant level for TCE in drinking water at 0.005 milligrams per liter (0.005 mg/L) or 5 parts of TCE per billion parts water (5 ppb).
- The Occupational Safety and Health Administration (OSHA) have set an exposure limit of 100 ppm (or 100 parts of TCE per million parts of air) for an 8-hour workday, 40-hour workweek.
- The EPA has developed regulations for the handling and disposal of TCE.

References

Agency for Toxic Substances and Disease Registry (ATSDR). 1997. Toxicological profile for TCE (electronic at **http://www.atsdr.cdc.gov/tfacts19.html**)

Report on Carcinogens, Eleventh Edition; U.S. Department of Health and Human Services, Public Health Service, National Toxicology Program, 2005 (2005 electronic at **http://ntp.niehs.nih.gov/ntp/roc/toc11.html**)

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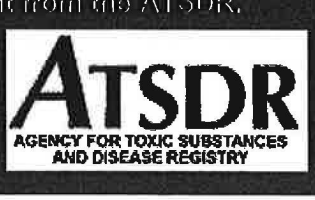

Updated 10/12/06

Bureau of Environmental Health
Health Assessment Section
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Tetrachloroethylene (PCE)

Other names for tetrachloroethylene include PCE, perchloroethylene, PERC or tetrachloroethene.

What is PCE?

Tetrachloroethylene (also known as PCE, PERC or perchloroethylene) is a man-made chemical that is widely used for dry cleaning clothes and degreasing metal. It is also used to make other chemicals and can be found in some household products such as water repellents, silicone lubricants, spot removers, adhesives and wood cleaners. It easily evaporates (turn from a liquid to a gas) into the air and has a sharp, sweet odor. PCE is a nonflammable (does not burn) liquid at room temperature.

How does PCE get into the environment?

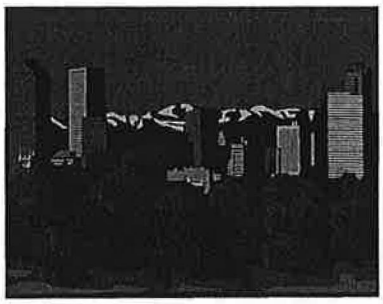
PCE can evaporate into the air during dry cleaning operations and during industrial use. It can also evaporate into the air if it is not properly stored or was spilled. If it was spilled or leaked on the ground, it may find its way into groundwater (underground drinking water).

People can be exposed to PCE from the environment from household products, from dry cleaning products and from their occupation (work). Common environmental levels of PCE (called background levels) can be found in the air we breathe, in the water we drink and in the food we eat. In general, levels in the air are higher in the cities or around industrial areas where it is used more than rural or remote areas.

The people with the greatest chance of exposure to PCE are those who work with it. According to estimates from a survey conducted by the National Institute for Occupational Safety and Health (NIOSH), more than 650,000 U.S. workers may be exposed. However, the air close to dry cleaning business and industrial sites may have levels of PCE higher than background levels. If the dry cleaning business or industry has spilled or leaked PCE on the ground, there may also be contaminated groundwater as well.

What happens to PCE in the environment?

Much of the PCE that gets into surface waters or soil evaporates into the air. However, some of the PCE may make its way to the groundwater. Microorganisms can break down some of the PCE in soil or underground water. In the air, it is broken down by sunlight into other chemicals or brought back to the soil and water by rain. PCE does not appear to collect in fish or other animals that live in water.



How can PCE enter and leave my body?

PCE can enter your body when you breathe contaminated air or when you drink water or eat food contaminated with the chemical. If PCE is trapped against your skin, a small amount of it can pass through into your body. Very little PCE in the air can pass through your skin into your body. Breathing contaminated air and drinking water are the two most likely ways people will be exposed to PCE. How much enters your body depends on how much of the chemical is in the air, how fast and deeply you are breathing, how long you are exposed to it or how much of the chemical you eat or drink.

Most PCE leaves your body from your lungs when you breathe out. This is true whether you take in the chemical by breathing, drinking, eating, or touching it. A small amount is changed by your body (in your liver) into other chemicals that are removed from your body in urine. Most of the changed PCE leaves your body in a few days. Some of it that you take in is found in your blood and other tissues, especially body fat. Part of the PCE that is stored in fat may stay in your body for several days or weeks before it is eliminated.

Can PCE make you sick?

Yes, you can get sick from contact with PCE. But getting sick will depend upon:

- How much you were exposed to (dose).
- How long you were exposed (duration).
- How often you were exposed (frequency).
- General Health, Age, Lifestyle Young children, the elderly and people with chronic (on-going) health problems are more at risk to chemical exposures.

How can PCE affect my health?

Exposure to very high concentrations of PCE (particularly in closed, poorly ventilated areas) can cause dizziness, headache, sleepiness, confusion, nausea, difficulty in speaking and walking, unconsciousness and even death. Skin irritation may result from repeated or extended contact with it as well. These symptoms occur almost entirely in work (or hobby) environments when people have been accidentally exposed to high concentrations or have intentionally used PCE to get a "high." Normal background levels (or common environmental levels) will not cause these health affects.

Does PCE cause cancer (carcinogen)?

In the United States, the National Toxicology Program (NTP) releases the *Report on Carcinogens* (RoC) every two years. The *Report on Carcinogens* (RoC) identifies two groups of agents: "Known to be human carcinogens" & "Reasonably anticipated to be human carcinogens."

PCE has been shown to cause liver tumors in mice and kidney tumors in male rats. There is limited evidence for the carcinogenicity of PCE in humans. PCE has been studied by observing laundry and dry-cleaning workers, who may also have been exposed to other solvents, especially trichloroethylene (TCE), but also petroleum solvents.

The *Eleventh Report on Carcinogens* (RoC) has determined that PCE may reasonably be anticipated to be a carcinogen.

Reference:

Agency for Toxic Substances and Disease Registry (ATSDR). 1997. Toxicological Profile for tetrachloroethylene. Atlanta, GA: U.S. Department of Health and Human Services, Public Health Service

Report on Carcinogens, Eleventh Edition; U.S. Department of Health and Human Services, Public Health Service, National Toxicology Program, 2006. http://ntp.niehs.nih.gov/ntp/roc/toc11.html

Is there a medical test to show whether you have been exposed to PCE?

One way of testing for PCE exposure is to measure the amount of the chemical in the breath, much the same way breath-alcohol measurements are used to determine the amount of alcohol in the blood. Because PCE is stored in the body's fat and slowly released into the bloodstream, it can be detected in the breath for weeks following a heavy exposure. Also, PCE and trichloroacetic acid (TCA), a breakdown product of PCE, can be detected in the blood. These tests are relatively simple to perform but are not available at most doctors' offices and must be done at special laboratories that have the right equipment. Because exposure to other chemicals can produce the same breakdown products in the urine and blood, the tests for breakdown products cannot determine if you have been exposed to PCE or the other chemicals that produce the same breakdown chemicals.

What has the federal government made recommendations to protect human health?

The EPA maximum contaminant level for the amount of PCE that can be in drinking water is 0.005 milligrams PCE per liter of water (0.005 mg/L).

The Occupational Safety and Health Administration (OSHA) have set a limit of 100 ppm for an 8-hour workday over a 40-hour workweek.

The National Institute for Occupational Safety and Health (NIOSH) recommends that PCE be handled as a potential carcinogen and recommends that levels in workplace air should be as low as possible.

The Ohio Department of Health is in cooperative agreement with the Agency for Toxic Substances and Disease Registry (ATSDR), Public Health Service, U.S. Department of Health and Human Services.

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ATSDR
AGENCY FOR TOXIC SUBSTANCES AND DISEASE REGISTRY

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